

INSTRUCTIONS

for assembling and operating

LIONEL TRAINS



IMPORTANT

1949 Lionel train outfits are designed for use with "Multi-Control" transformers which are equipped with built-in controls for operating the locomotive reversing mechanism and for blowing the train whistle. For this reason 1949 outfits do not include a separate No. 167 Whistle Controller previously furnished with all whistling outfits.

All "027" Gauge outfits include a No. 1033 "Multi-Control" Transformer which is suitable for operating the outfit plus a few accessories.

"O"Gauge outfits do not include a transformer; a separate transformer must be purchased from your dealer.



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INTRODUCTION

Few hobbies in the world offer as much fun as model railroading. Here, in miniature, are all the color and excitement and drama of real railroading, with speedy passenger trains and fast freights making runs through cities and towns and open countryside.

If you are a beginner in this fascinating pastime and this is your first Lionel outfit you will need a few simple directions to set up your layout and to run your train. The first section of this booklet, **HOW TO RUN YOUR OUTFIT**, contains all the directions you need in order to enjoy any simple standard train outfit.

If you are like most model railroaders you will eventually want to expand your simple outfit into a real model railroad. To do that you will need a few hints about selecting a space for a permanent layout; designing various track arrangements to suit available space; landscaping your layout; and working out actual railroading practices and special track problems with Lionel equipment. You will find this information in the second section of the book, **BUILDING A MODEL RAILROAD**.

The third section of this booklet, **LIONEL RAILROAD ACCESSORIES**, contains the operating and wiring directions for switches, track signals, stations, bridges, cranes and loaders and other auxiliary railroading equipment made by Lionel. Consult this section to find out about voltage requirements of various Lionel accessories, power needs of your projected railroad system, capacity and limitations of your transformer and the best methods for wiring up your layout and accessories.

Like all fine mechanical equipment, your Lionel outfit deserves good care. If it is properly cared for, your Lionel equipment will give many years of service and enjoyment. Information that should enable you to find and eliminate trouble spots and to keep your equipment in tip-top condition is contained in the last section of the booklet, entitled **SERVICING LIONEL TRAINS**. Refer to it for hints on proper maintenance, trouble shooting, replacement of lamps, and the names and addresses of Lionel Authorized Service Stations.

HOW TO RUN YOUR OUTFIT

ASSEMBLING THE TRACK

The track supplied with most outfits will make a simple oval layout. The curved sections make up ends of the ovals, the straight sections make up the sides. A special Remote Control Section, used for uncoupling and unloading cars, goes on the side of the oval. Join the track by inserting the pins of one track section as far as they will go into the rail openings of the next section. Track connections must be clean and tight. To hold track sections securely together use the connecting clips supplied with the track. "O" Gauge clips are pushed over the track ties as shown in Figure 1. Clips for "027" Gauge are hooked onto the tie of one section then snapped over the end tie of the next section.

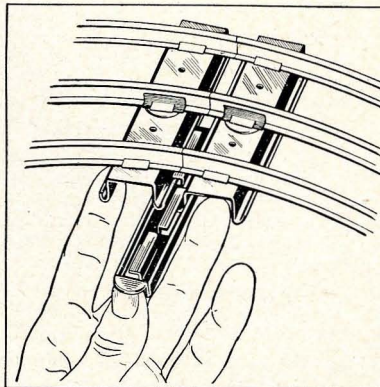


Figure 1—"O" Gauge Track Clip

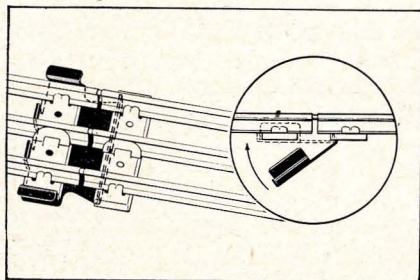


Figure 2—"027" Gauge Track Clip

LOCKON CONNECTIONS

Each spring clip of the Lockon is connected to one of the transformer terminals by a piece of copper wire furnished with the outfit. The wires are coiled only for convenience and may be straightened when necessary. Remove the insulating covering from the ends of the wire by scraping with a sharp edged knife, scissors, etc. Be careful not to cut the copper. Push down the springy upper half of the Lockon No. 2 terminal clip until the metal loop in the lower part projects through the top. Insert the bare wire end into the loop and release the upper half. Spring tension will hold the wire tight. The other end of the wire from No. 2 Lockon terminal is usually connected to binding post "A" or "B" on smaller transformers and "U" on Types

ATTACHING THE LOCKON

After the track is joined, attach the Lockon which is included with each outfit. The Lockon is used to feed power to the rails from the transformer. Fit the flange of one of the outside rails into the wide V-shaped notch of the Lockon and press the Lockon upward until the spring contact snaps onto the center rail as in Figure 3. Lockons should be attached to straight sections of track.

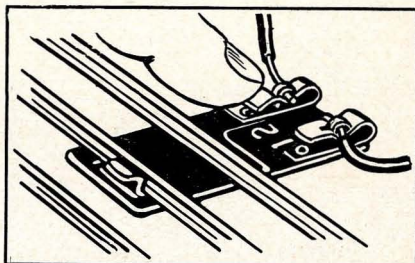


Figure 3—Lockon Connections

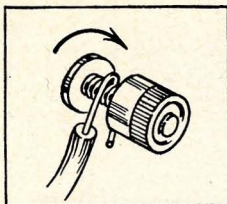


Figure 4—Binding Post Connection

VW and ZW. Wrap the bare wire end around the screw portion of the binding post (See Figure 4). Screw down the thumb nut tightly to hold the wire. If you wrap the wire around the post in clockwise direction, as shown by the arrow, it will not slip out of place as you tighten the thumb nut. In the same way connect Lockon terminal No. 1 to a second transformer binding post, ("U" on the smaller transformers and "A" or "D" on transformers VW and ZW). For detailed instructions see leaflet packed with your transformer.

POWER SUPPLY FOR YOUR TRAIN

1. Never connect your train layout directly to an electric outlet. Always use a transformer.

A transformer changes the high voltage electric power used in your house (usually 115 volts) to the low voltage used for operating toy trains (from 8 to 18 volts). The transformer cord is plugged into any convenient wall outlet. Low voltage is then obtained from the binding posts on top or in back of your transformer.

2. All household power lines are not alike. Make sure that the voltage and frequency (cycles) of your electric power supply correspond to the rating of your transformer. If in doubt ask your electric company.
3. If you happen to have direct current (DC) a transformer cannot be used for it will burn out immediately.

For a full discussion of your power supply see page 36.

HOW ASSEMBLED LAYOUT SHOULD LOOK

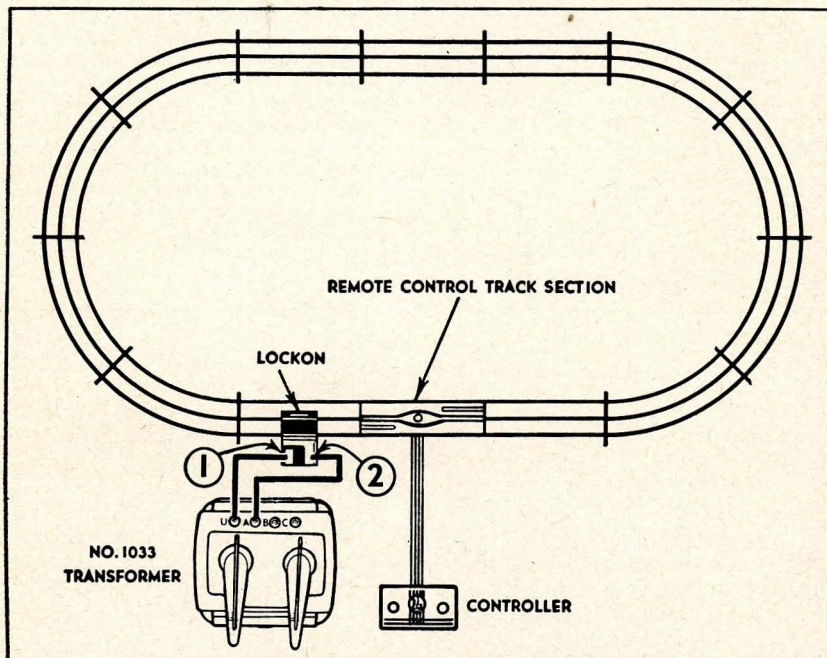


Figure 5—How Train Controls Should Be Grouped Together

CHECK AND LUBRICATE YOUR ROLLING STOCK

A Lionel train outfit consists of a locomotive, tender and several cars. Unpack your rolling stock carefully. Save the corrugated board packing and the boxes. They will come in handy for storing or transporting your equipment. Check the equipment to see that nothing is missing or broken. See that all car wheels turn freely; put a dab of Lionel lubricant on the ends of the wheel axles.

Examine the locomotive. If you have one of the following locomotives: 675, 1655, 1656, 2025, or 2026, you should lubricate the ends of the armature shaft (See Figure 6) before you even try to run it or else it may squeak or bind. The driving wheels of these locomotives should turn smoothly, without sticking or catching. If you have one of the following locomotives: 622, 671, 2020, 2332 or 2333, you don't need to bother with immediate lubrication. The motors used in these locomotives have a large lubricant reservoir which is filled at the Factory and which cannot be reached without taking off the locomotive body.

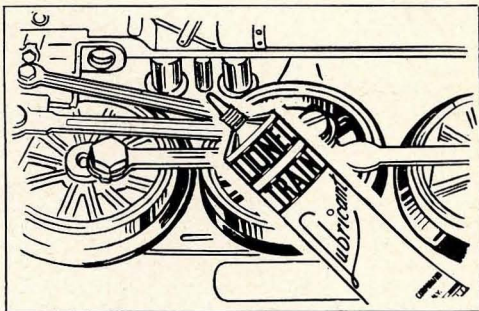


Figure 6—Lubricating Locomotive Motor

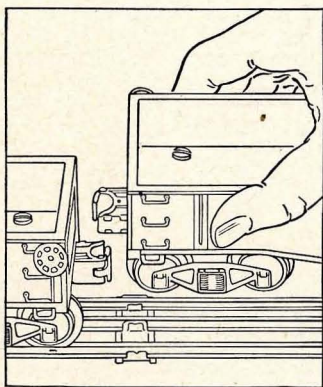


Figure 7—How to Couple Cars
By Hand

SETTING UP THE TRAIN

Place the locomotive and tender on the track and join them by means of the locomotive draw bar. Then couple on the rest of the cars by raising the end of the car and engaging the couplers by hand (See Figure 7). Close the open couplers by pushing in the coupler knuckle until it latches.

Before putting the transformer power on, make sure that all the wheels are properly set on the track. If they are not they may cause a "short circuit" and the train will not operate.

SHORT CIRCUITS

Most troubles in running an electric train are caused by accidental short circuits. A short circuit is a direct connection between two transformer posts. It is caused most often by a derailed truck or a piece of metal or tinsel lying across the track and connecting the center rail to the outside rail. A short circuit causes an excessive current to be drawn from the transformer. When a short circuit occurs the train stops, the lights dim or go out altogether; the transformer overheats and, if unprotected, will burn out.

To protect the transformer from the danger of burn-outs most modern Lionel transformers are equipped with built-in circuit breakers. If too great a current is drawn from the transformer, the circuit breaker opens and cuts off all power from the track. In a few seconds the circuit breaker resets automatically but will reopen almost immediately if the short circuit still exists. Lionel transformers RW, VW and ZW are also equipped with red warning lights which go on whenever a circuit breaker opens.

CHANGING THE TRAIN SPEED

The speed of the train is varied by moving the voltage control on the transformer panel. The higher the voltage the greater the speed. Most Lionel transformers provide at least two different voltage ranges. The lower range is used for light trains; the higher range for heavier trains. Always try the lowest range first; use the higher range only if the train does not go fast enough. When running your train keep one hand on the voltage control. In this way you will be able to slow the train down in curves, speed it up along the straight-away or bring it down to a gradual stop at the uncoupling track section.

REVERSING THE LOCOMOTIVE

Lionel locomotives can be stopped and reversed by *remote control*. The reversing mechanism is known as the "E-Unit." It is mounted within the locomotive and is operated by momentary interruptions of current to the track. This operation can be performed at any distance from the locomotive either by operating the "Direction" control on the transformer, or by turning the voltage control to "OFF" position. (The accidental "shorting" of the track, or disconnecting of one of the current-carrying wires will also cause the E-Unit to operate.)

The E-Unit has three positions which operate in rotation: Forward, Stop, Reverse, Stop, etc. When the locomotive is running move the "Direction" control *once* to stop it and *twice* to reverse it. The Stop or Neutral position enables the locomotive to stand still even though power for accessories, lights, etc. is still supplied to the track.

HOW TO DISCONNECT REVERSING MECHANISM

The E-Unit can be disconnected by pushing the E-Unit lever to the OFF position. Then the locomotive will not reverse automatically but will always run in the same direction. To disconnect the E-Unit start the locomotive going in the desired direction; stop it with your hand while power is on; then move the E-Unit lever to OFF. Figure 8 shows the location of the E-Unit lever in three types of Lionel locomotives.

NOTE: If the E-Unit is disconnected while it is in Neutral position, the locomotive will not start at all. Also, because it is operated by gravity the E-Unit will not work if the locomotive is placed on its side or held upside down.

BLOWING THE WHISTLE

Following actual railroading practice most Lionel steam-type locomotive and tender combinations are equipped with a whistle, while the electric and diesel locomotives contain a horn. Both the whistle and the horn can be sounded anywhere on the track by means of the whistle controller. In most modern Lionel transformers the whistle controller is built-in and is operated by a button or lever on the transformer panel. If your transformer does not have a built-in controller, an external No. 167 Whistle Controller must be used. See Page 11.

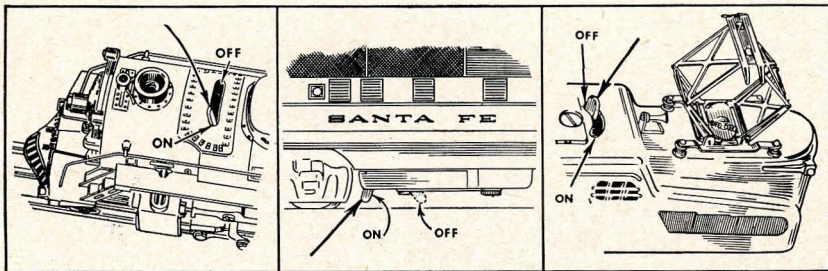


Figure 8—Location of E-Unit Lever on Various Locomotives

Type VW and ZW transformers have two built-in controllers — one for each of its two train circuits — so that if you operate two trains on different circuits you can control each whistle separately. The two circuits which have whistle controllers are at terminals A-U and D-U. The remaining circuits B-U and C-U are used for accessories and have no controllers. If you connect your track to either of these pairs of terminals you will not be able to blow the train whistle unless a separate 167 controller is used.

The power for operating the whistle and the horn in the electric locomotive is supplied through the track. The horn of No. 2333 Diesel, however, is powered by a flashlight cell which is inserted into the locomotive body. When it is worn out the cell can be replaced by any standard size D flashlight cell.

No. 1655 Switching locomotive and tender and the 622 Diesel switcher do not have a whistle. Instead they contain a bell which rings automatically. The bell in 1655 Switcher is connected or disconnected by means of a lever switch on the tender.

NOTE: The Lionel whistle can be used only with alternating current having a frequency of more than 40 cycles. When line frequency is less than 40 cycles (some parts of Canada and some communities in the United States use 25-cycle power lines) the whistle cannot be controlled but will blow continuously.

SMOKE LOCOMOTIVES

Many Lionel locomotives are equipped to produce odorless, realistic "smoke." Drop a smoke pellet into the smoke stack and turn on the track power. In a few seconds the heater within the smoke generator will melt the pellet and smoke will rise out of the stack. The locomotive will puff only when the wheels are turning.

Each pellet has enough smoke material to last a long time. For best results use up one pellet before dropping in another. Too many pellets will actually reduce the amount of smoke.

After the locomotive has been used for a while it may produce less smoke than it did at first. This may be caused by smoke material clogging up the air opening inside the generator. Increase the track power slightly and let the locomotive stand in neutral for a few minutes. This treatment clears the smoke generator and the locomotive will puff as well as ever.

All modern Lionel locomotives must use *SP Smoke Pellets* which come in glass bottles, as shown in Figure 10. *Don't use any other material* or you may destroy the smoke generator.

After a few hours of use you may find that a white powder has collected in the smoke stack. This is all smoke material. Push it back into the smoke stack. Use the wood tamper provided. A whitish deposit on the locomotive body can be cleaned off with soft cloth moistened with a little Lionel Lubricant.



Fig. 10—SP Pellets

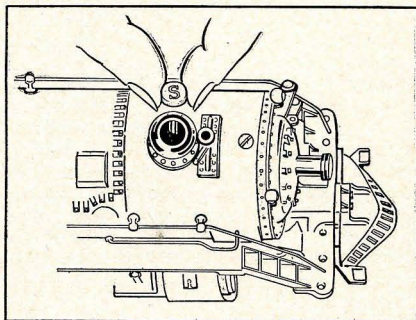


Figure 9—Drop Smoke Pellet Into Locomotive Smoke Stack

SP Smoke Pellets have been rigorously tested by recognized testing laboratories. They are absolutely harmless even if accidentally swallowed.

UNCOUPLING CARS

All standard 1949 Lionel cars are equipped with electrically operated "magnetic" knuckle-type couplers. These couplers are opened by means of the Special Remote Control Section of track furnished with the outfit. The section used with "O" Gauge track is known as UCS; a similar section matching the "027" track is No. 6019. These sections consist of five rails and a centrally located electro-magnet. They are connected to their controllers by a four-wire cable and are inserted into the track layout as any regular straight section. (See Figure 6) One remote control section is supplied with every Lionel outfit. Additional remote control sets can be purchased from your dealer to permit uncoupling and operation of car in as many places in the layout as you wish.

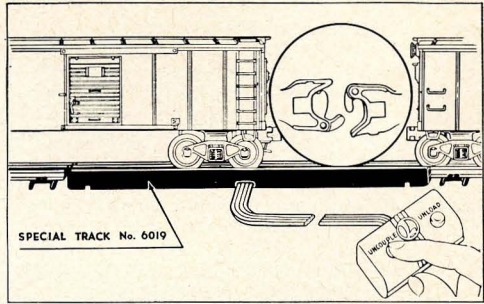


Figure 11—Uncoupling "Magnetic" Trucks

To open a closed coupler move the car to the remote control section so that the front wheels of the truck you want opened are over the electro-magnet; (See Figure 11) then press the "Uncouple" button on the controller. The coupler can also be opened while the car is in motion by pressing the "Uncouple" button at the proper time. Cars can be separated by opening either of the mating couplers.

To couple two cars it is necessary only to push them together. Reverse the locomotive and slowly bring the cars together until the couplers engage and latch. This can be done anywhere along a straight stretch of track as long as at least one of the couplers is open.

Switching engines and older model cars are equipped with "electromagnetic" coupler trucks. These trucks do not have an armature plate; instead a small coil is wound around each coupler. These couplers will latch with the "magnetic" couplers and can also be opened on the Remote Control Sections. For further details read page 10.

OPERATING CARS

Many Lionel freight train outfits include at least one car which can be unloaded by remote control. These operating cars include No. 3551 Lumber Car with stakes which tilt, permitting logs to roll off; Coal Dump Car No. 3469 which tilts to unload imitation coal; No. 3472 Milk Car which unloads miniature milk cans and others.

Each of these cars has its own built-in mechanism and operates on the same Remote Control Track Section used for uncoupling. The electrical connection between the car and the track is made by means of contact sliders

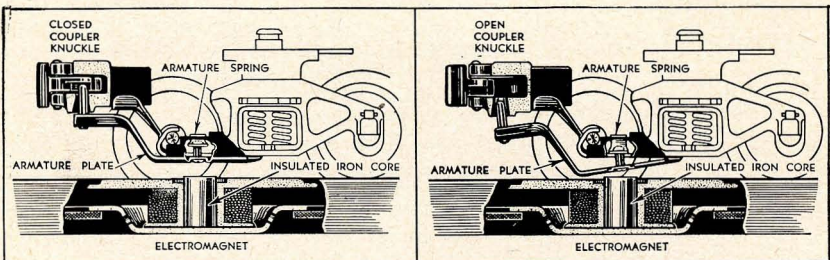


Figure 12—How "Magnetic" Couplers Operate

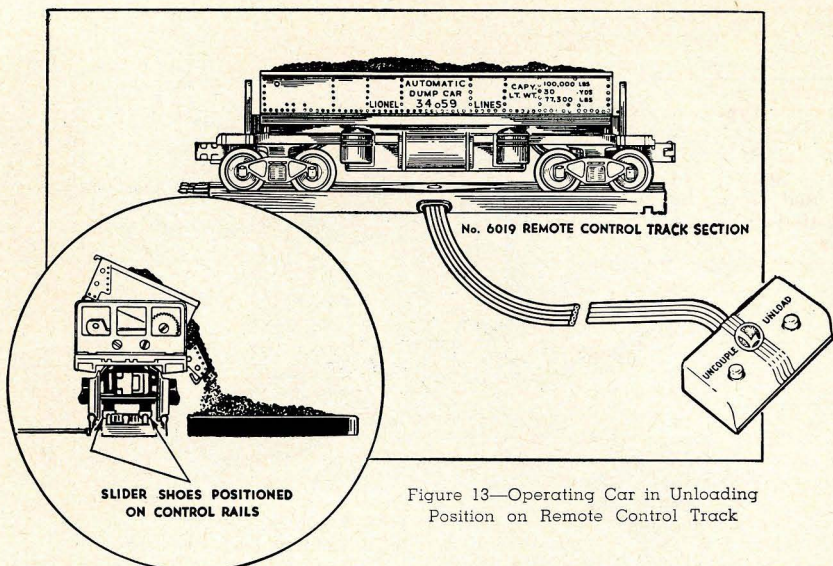


Figure 13—Operating Car in Unloading Position on Remote Control Track

located on the car trucks. To unload the car stop the train so that the contact sliders rest on the control rails of the special track sections; (See Figure 13) then press the "Unload" button of the controller.

No. 3464 Animated Box Car and No. 6520 Searchlight Car work in a slightly different way. Instead of having sliders to make contact with the control rails these two cars are operated by means of a plunger or armature which is attracted to the track electro-magnet. To switch the searchlight on and off, or to open the door of the Box Car, position the plunger over the electro-magnet and press the "Uncouple" button. To return the man into the car slide the door shut by hand.

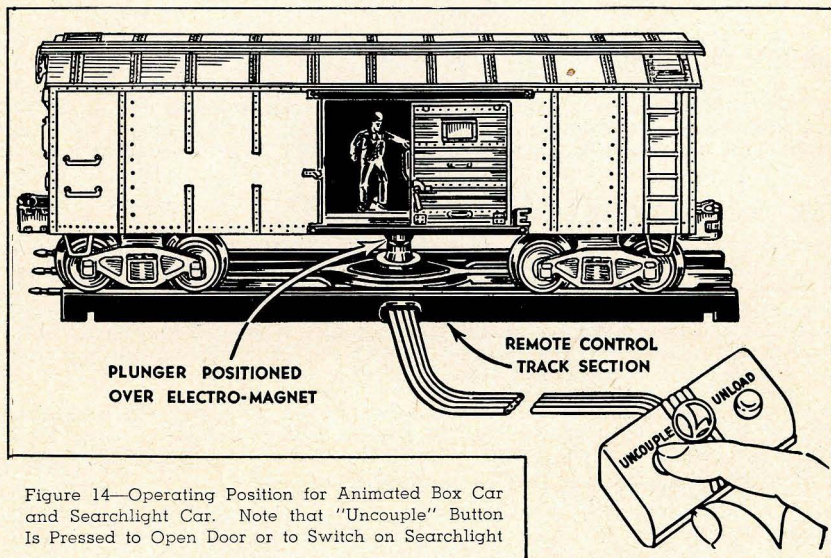


Figure 14—Operating Position for Animated Box Car and Searchlight Car. Note that "Uncouple" Button Is Pressed to Open Door or to Switch on Searchlight

No. 3472 AUTOMATIC MILK CAR

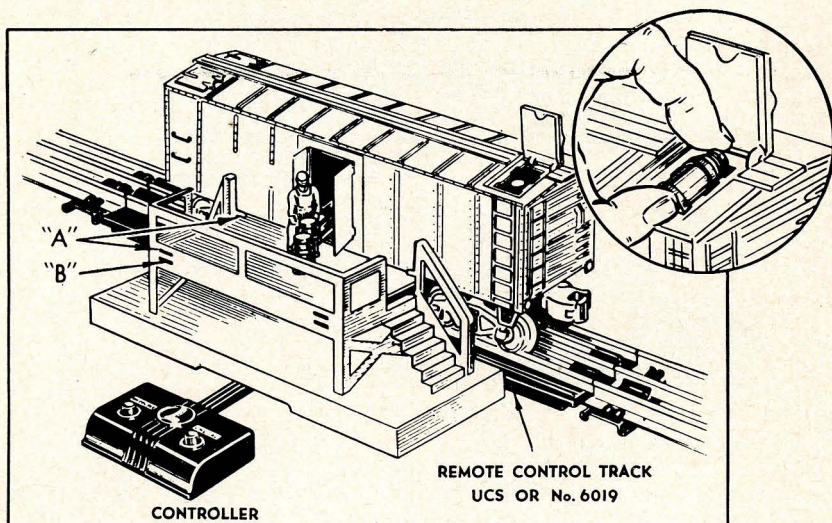


Figure 15—Installation for No. 3472 Automatic Milk Car

Install the unloading platform provided with the Milk Car next to a remote control track section, as shown in Figure 15. When used with "O" gauge track the floor of the platform should be inserted into the top "A" slots in the frame; when used with "027" track the floor should be fitted into the bottom slots "B". Simply pull out the floor platform and insert it into the proper slots and the corresponding notches on the side of the framework facing the track.

The miniature milk cans furnished with the car are loaded into the car by hand through the opening in the roof. (See inset in Figure 15). Do not try to load any more than 7 cans into the car. Press "Unload" button of the controller cars. Adjust your track voltage until the milkman unloads the cans vigorously but without knocking them over. The small magnets inserted into the bottom of the cans help to keep them upright.

ELECTRO-MAGNETIC COUPLERS

Switching engines as well as a number of cars made prior to 1949 are equipped with "electro-magnetic" couplers, which have individual coils instead of armature plates. Operation of these couplers is illustrated in Figure 16. The car is positioned on the remote control section so that the slider shoe makes contact with the control rail. When the "uncouple" button of the controller is pressed the coupler coil is energized, pulling back the plunger and allowing the coupler knuckle to snap open.

The "electro-magnetic" couplers can be coupled with any other knuckle coupler and can be operated on any Remote Control Section, either UCS and No. 6019, or the previously manufactured RCS and No. 1019.

Operating cars equipped with "electro-magnetic" couplers uncouple at one end whenever the "Unload" button is pressed. This is the normal operation of these cars and does not mean that the car is defective. After unloading simply recouple the car by reversing the locomotive for an instant.

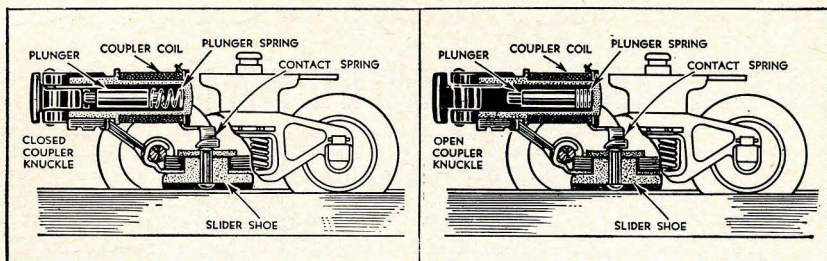


Figure 16—Operation of an "Electromagnetic" Coupler

USE OF No. 167 WHISTLE CONTROLLER

No. 167 Whistle Controller must be used in conjunction with transformers which do not have a built-in whistle controller. When No. 167 controller is used, one of its posts must be connected to the No. 1 clip of the track lockon while the other is connected to the proper transformer binding post.

Types VW and ZW transformers have two built-in whistle controllers. If you wish to supply track voltage to more than two layouts with the same transformer you must use 167 Whistle Controllers for B-U and C-U pairs of transformer terminals.

Because of voltage losses in the controller itself, outfits using No. 167 external whistle controller require a transformer voltage setting from 3 to 4 volts higher than they do ordinarily. This is not due to any defect in the equipment, but to the design of the 167 whistle controller.

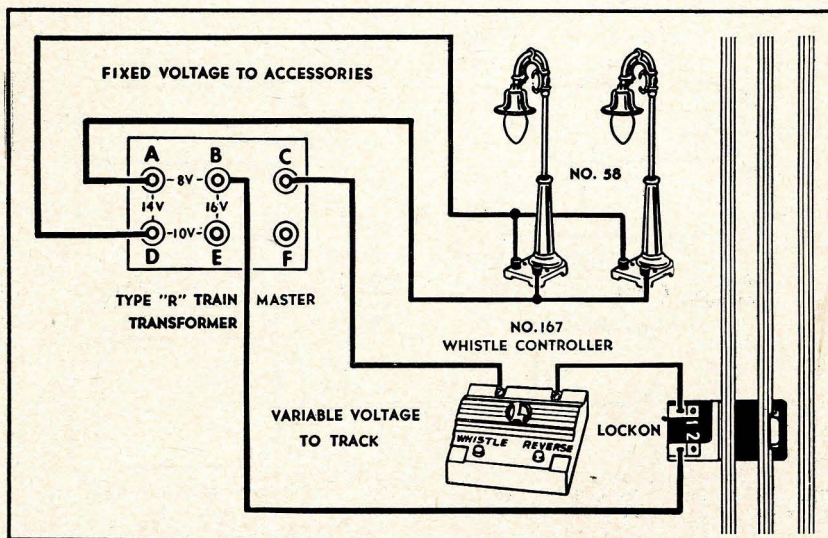


Figure 17—How to Install No. 167 Whistle Controller

BUILDING A MODEL RAILROAD

DESIGN A TRACK LAYOUT TO FIT AVAILABLE SPACE

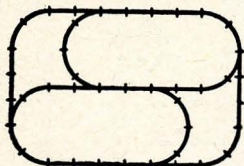
A number of factors must be taken into consideration before you decide what sort of track plan your model layout will have. First, how much space do you have? Second, how much rolling stock—freight and passenger cars? How many accessories do you own? What are your future plans for expansion? For example, if you have a Lionel train set consisting of a locomotive, tender and three to five cars, a layout of about 6 by 8 feet would probably be ample. If you have a number of cars and two or more locos, you'll find that the layout should be about 10 or 12 feet long and 8 feet wide.

The diagrams shown below (Fig. 18) are simply *suggestions* to illustrate the principles involved in sound, workable track plans. Additional plans may be found in the Lionel catalog. Remember, in planning the route for your trains to take, to allow for future growth of your rail system. As you add locomotives and cars, you will want

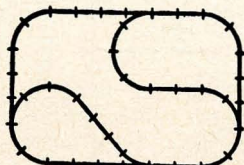


a classification yard, more sidings, spurs, wyes and reversing loops.

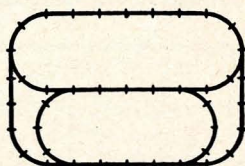
The more track you have, the larger and more interesting will be your model railroad. If your train can cross over from one main line to another, can spot cars on a siding, reverse its direction of travel, etc., it is a lot more fun to operate than a train which can only circle a loop of track going in one direction. So, in planning your layout, be sure that there will be plenty of interest and variety in the journeys your hotshot freights and fast limiteds can make.



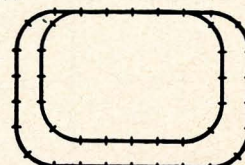
TRACK REQUIRED: 18 straight, 14 curved, 2 left, 4 right switches. SPACE REQUIRED: For "027" 56¼ by 85½ inches. For "O" Gauge, 60 by 90 inches.



TRACK REQUIRED: 19 sections of straight track, 14 sections of curved track, and two pairs of switches. SPACE REQUIRED: For "027" gauge: 56¼ by 85½". "O" Gauge: 60 by 90 inches.



TRACK REQUIRED: 18 sections of straight track, 14 sections of curved track, 3 pairs of switches. SPACE REQUIRED: For "027": 56¼ by 85½ inches. "O" Gauge: 60 by 90 inches.



TRACK REQUIRED: 24 straight, 14 curved and 1 pair of switches. SPACE REQUIRED: for "027", 56¼ by 85½ inches. "O" Gauge, 60 by 90 inches.

Figure 18—Some Suggested Track Plans

LOCATION—IN THE CELLAR

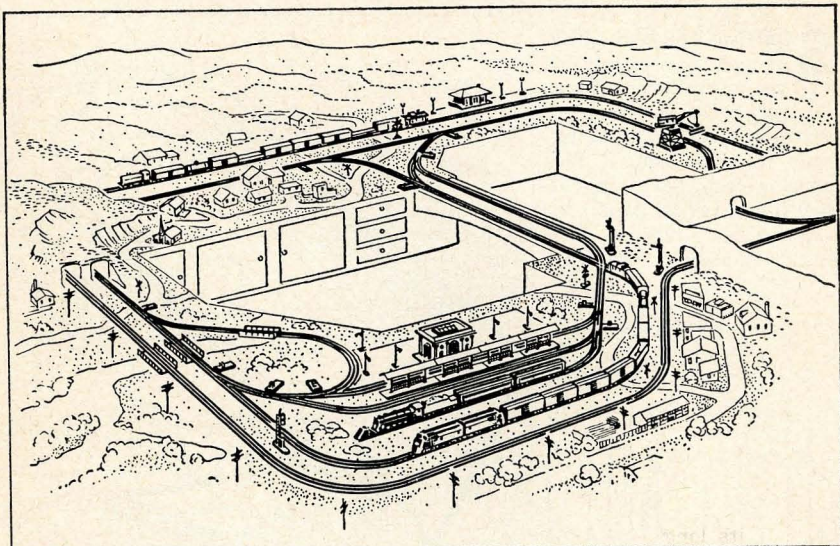


Figure 19

IT'S AN IDEAL SPOT, PROVIDED THERE'S NO DAMPNESS AND PLENTY OF ROOM.

To the city apartment dweller, or suburbanite whose house has its space limitations, the elaborate layout above (Fig. 19) may have to be passed up in favor of a model pike like that shown on page 15.

However, if you *do* have a roomy cellar the Lionel railroad "empire" illustrated here is an ideal one to build. Of course an intricate landscaped rail system like this is not done overnight; usually months or even years are taken to complete it. Note the cabinets and drawers in the center well, where equipment, tools, etc., can be stored.

A dry cellar is an especially good place for a Lionel pike because it is usually cool in summer, warm in winter and is generally free from such obstructions as rafters, stanchions, and other hazards.

A variation of the above square-type layout is the "runaround", especially suited for cellars. Here the track runs along the ledge of a

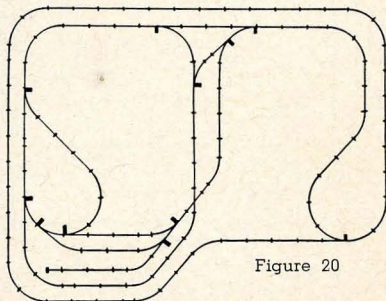


Figure 20

wall, not only consuming little space but also providing a dramatic stretch of main line.

Be sure to build any layout away from such places as coal bins, furnaces, oil tanks, meters and storage closets or any place where it will be a "traffic" problem.

The track diagram above (Fig. 20) shows how an interesting layout can be made for the operation of three or more trains. Reversing loops, wyes, spurs and sidings are all included so that real timetable schedules can be duplicated in miniature. Landscaping and texturing is done according to the methods outlined on page 18.

— IN THE ATTIC

SOME of the best of all model railroads are set up in attics where, in most cases, a sweep of entire length of the house can be obtained. The rectangular-type layout seen here (Figs. 21-22) is specifically designed for this purpose.

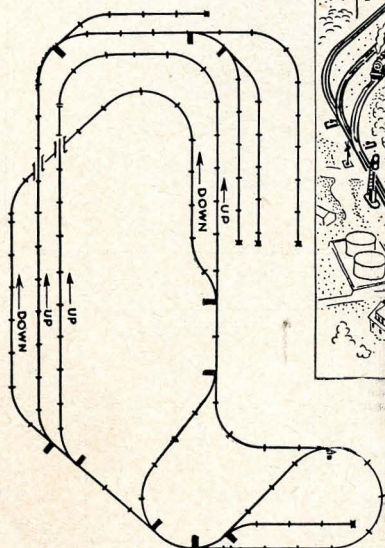


Figure 21—A Layout for the Years

With its long stretches of main-line, its loops and wyes and spurs, with its three-train terminal, you're not apt to grow tired of this layout after a few weeks. Far from it! You could run through enough train operations and solve enough railroad problems here to keep you busy for many months.

The upgrades and downgrades plus the overpass and under pass, the large center well make this layout both interesting and practical. There is also plenty of area to build industrial scenes around accessories like coal and log loaders, water towers, cranes, etc.

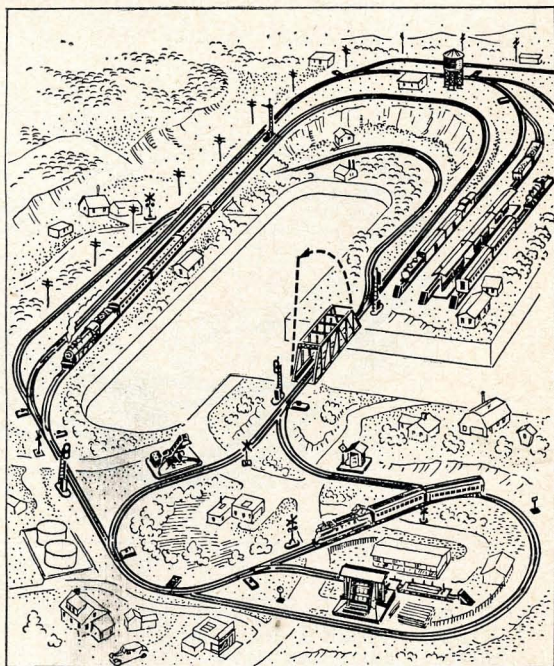


Figure 22

AN ATTIC OFFERS LIMITLESS POSSIBILITIES

Dormer windows, jogs, "L" rooms, studding—these apparent liabilities encountered in many attics can be quickly turned into assets which no other locale in the house offers.

For example, the portion of a layout that includes a jog or dormer makes an ideal spot for locos to take on coal and water. Rooms that are "L" shaped offer many possibilities for good point-to-point pikes. Studs and rafters make excellent supports for layouts and cut down on the number of legs your table will need.

Another advantage which an attic holds over other parts of the house, including the cellar, is that nails can be driven directly into the floor. This makes layout construction much sturdier and far simpler.

— OR IN THE BOY'S BEDROOM!

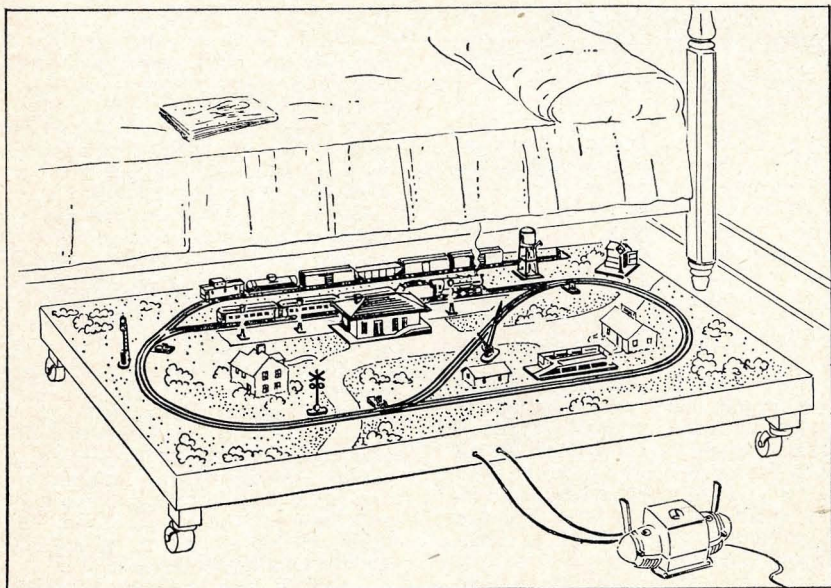


Figure 23

A SLIDE-AWAY LAYOUT LIKE THIS IS A REAL SPACE-SAVER—AND REAL FUN

If you live in a small house or the average size apartment, you won't be able to plan a pretentious model pike like those in Figs. 19 and 22.

However, you can have a whale of a lot of fun with the pocket-size layout shown in Fig. 23 above. Best of all, this model railroad takes up valuable space only when it is in actual use. When your Lionel train has made its last run for the day, pull out the transformer plug, roll the layout under the bed and, presto! you have a full-scale bedroom again!

A model road like this is not hard to build, either. The best, and probably cheapest, material for the layout top is $\frac{3}{4}$ " plywood. It can be reinforced from below, if you wish, to prevent warping and bellying. Attach legs to the plywood with casters, and dress up the sides with molding.

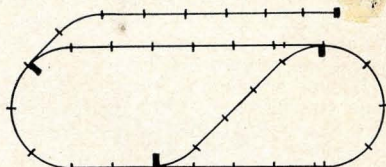


Figure 24

After the track is affixed securely with screws and the transformer and accessory wiring is completed, the pike is ready for use. The landscaping can be tackled later, at your leisure.

Dimensions for this slide-away layout have purposely been omitted, since they will vary with the size of the bedroom and the size of the bed (single, double or twin beds). Measure the space you have available and then plan your track scheme. Depending on overhead clearance, you may have to pass up vertical accessories like Floodlight Towers and Magnet Cranes in favor of low-lying stations, Girder Bridges, Gateman, etc. Check this carefully.

BUILDING YOUR LAYOUT

THE TABLE SHOULD BE STURDY AND WELL-BRACED

Nothing is more important in creating a good model railroad than building a solid, workable support for it. There are several different types, three of which are shown in Fig. 25 below.

After the track scheme is decided, and not before, the table or supports can be planned and built. For instance, if you are going to have an attic or a cellar "run-around" (page 13) you will want a shelf table like that illustrated in "A".

An "open" layout, which means you would have large areas of mountain, hills or fields between tracks, would be supported by an open framework similar to the kind in "B". (The open areas are covered with fine mesh wire and are then coated with plaster to form rolling farmlands.)

It may be that you plan to have extensive yards, stations, busy terminals or flat country terrain, instead of the above. That means you would want a solid table top, probably of plywood or beaver board, as shown in "C".

If you construct layouts of the type shown in "B" and "C" make sure the legs are well cross-braced to avoid sway and unsteadiness. If your plan is to build an "A"

type of layout in the cellar, where it will have to be anchored to a concrete or brick wall, you will have some preparatory work first. Chisel or drill a hole large enough for a wooden peg, which should be snug-fitting and driven into place with a mallet. This provides an ideal base for nails or screws.

When the table is completed, track sections can be attached. To prevent track from shifting, screw the sections to the table.

Naturally, you'll want to conceal all wiring. The best way to do this is to drill small holes next to the track connections and pass the wires through them and out of sight beneath the table.

A model railroad, like anything else creative, affords the builder a chance to show his imagination and ingenuity. Rarely are two layouts exactly the same. Each reflects the tastes and, to an extent, the personality of its owner.

On page 17 are shown five different model layouts. They all meet specific needs or overcome certain problems.

For example, layout "A", located in a bedroom, illustrates how you can set up a sizeable Lionel pike which, when not in use, occupies only a small amount of space. The portion in the foreground swings up against the wall, after use, and fastens by means of catches.

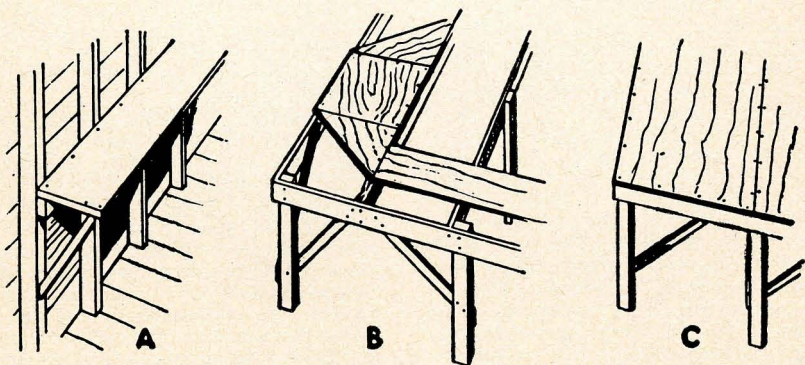


Figure 25

SOME PRACTICAL SUGGESTIONS

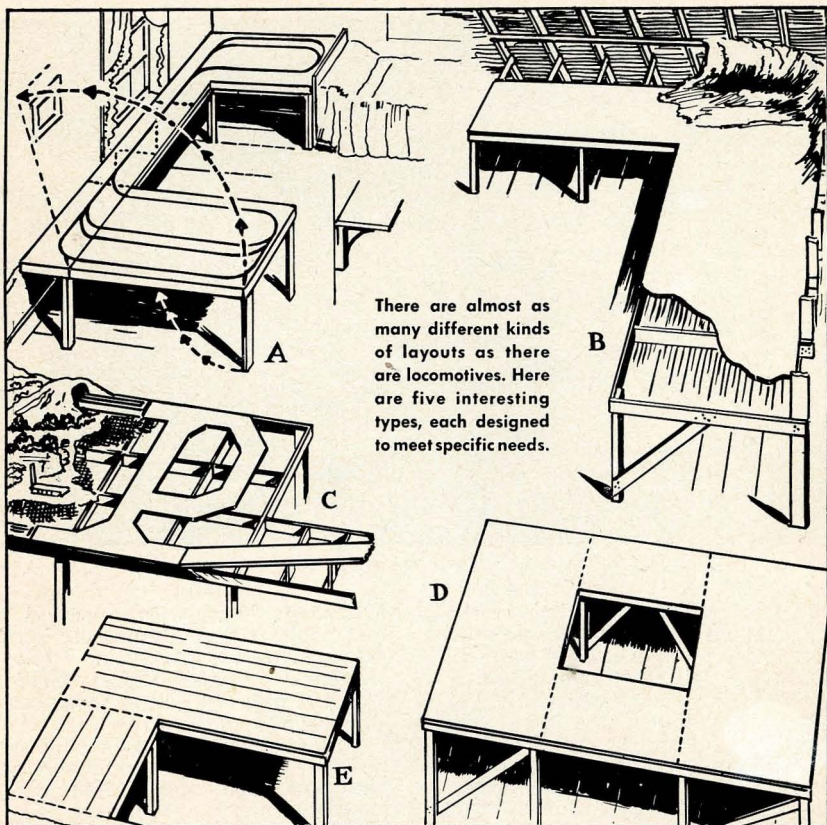


Figure 26

Layout "B" is ideal for a crowded or small attic. It consumes only under-the-eaves space, which is frequently not used for storage anyway. In the sketch the cutaway portion shows the frame construction of the table, while the corner illustrates how a background may be employed.

A good example of "open" construction is seen in layout "C". Here the builder plans to have rolling fields and mountains which he will achieve by coating shaped wire mesh with plaster, and then texturing. The tracks will be secured to the solid plywood strips. This open method of building is not only cheaper, but it also enables you to have ravines, valleys and other

topographical features below the track level.

The open center layout in "D" is just the thing for ease of train operation and for reaching any part of the pike in a jiffy, in case of shorts, derailment or other trouble.

In "E" the basic principle, accessibility, is given a different twist. The notched-out section provides a spot for the control panel and also enables the operator to reach any point on his layout.

The most important part of building a model pike is landscaping it.

Simple texturing and landscaping for a small pike is easy. After you have built a solid top table, lay

LANDSCAPING AND TEXTURING

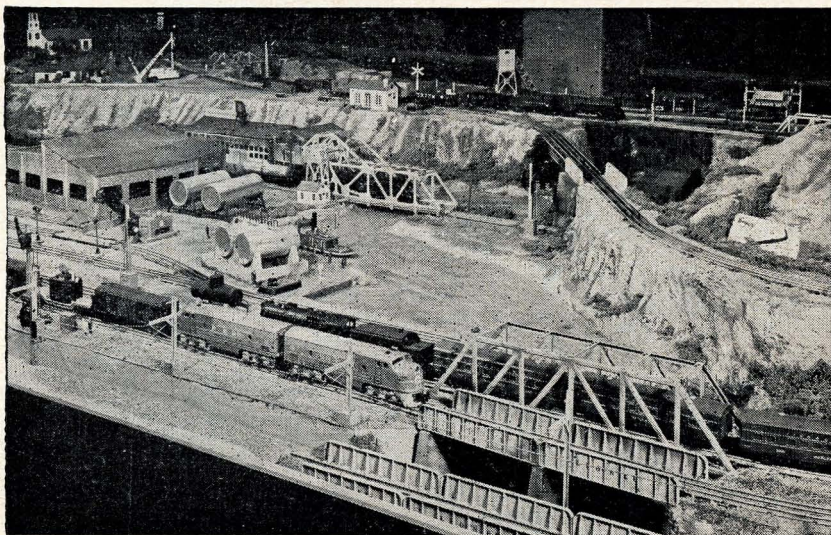


Figure 27—Part of a Landscaped Layout in Lionel Showroom

the track on it according to the scheme you have decided upon. *Do not attach the track.* With a pencil, mark out the track bed, allowing a width of $\frac{1}{2}$ " on each side of the ties. Now remove the track sections and, within the pencil boundaries, paint the track bed, using a deep shade of gray. Next, replace the track while the paint is still wet and screw the sections to the table to prevent shifting. Now sprinkle track ballast (which can be bought in any hobby or model railroad store in small bags) over the track. Brush away any excess after the paint dries.

Next, mark out roads, highways, and grassy areas. For fields,

lawns, etc., brush with green paint and, while still wet, sprinkle with Lionel No. 919 Artificial Grass, available at your Lionel dealer. For dirt patches, scatter dried coffee grounds.

Highways and roads should be painted light gray and scattered with fine sand. Score lightly to simulate ruts.

Complete the texturing by spotting hedges and bushes at various points. These are made from green-dyed Norwegian Lichen, which most hobby stores sell. Complete by locating houses, factories, churches, etc., which are sold in kit form in model railroad and hobby shops.



COMPLETING THE LAYOUT

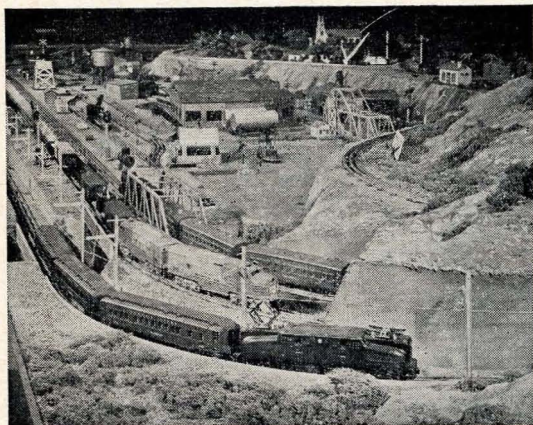


Figure 28

KEEP IT AUTHENTIC!

If you build a yards setting like this, give it the little touches that make it real. You may not have a working turntable, but you can have factories (sold in kits) spotted near a siding. Small hobby shop figures of porters, gandy dancers, engineers, etc., add a lot. Wheelbarrows, baggage carts, hand tools and other props also help.

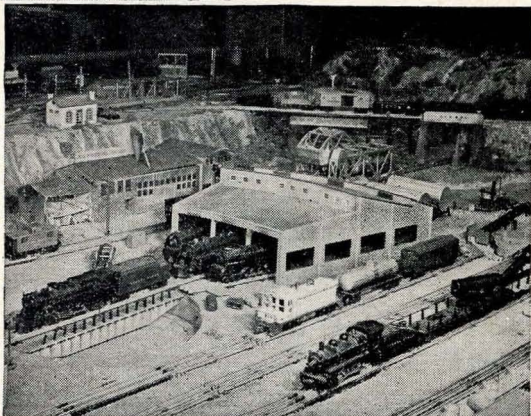


Figure 29

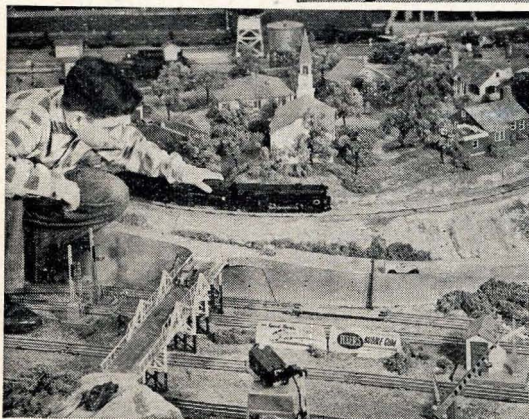


Figure 30

START SMALL, GROW WITH THE YEARS!

Like all hobbies, model railroading develops slowly. Start with a layout commensurate with your income and add to it each year. Many of the features, like houses, trees, lakes, etc., cost only a few pennies. Much of the material you probably have around the house. As you add tracks and rolling stock, extend your layout area.

"O" AND "027" GAUGE TRACK

Lionel track is made in two different sizes: the regular "O" gauge and the lighter "027". Figure 31 shows the difference between the two. Although the distance between the outside rails is the same, both types of track cannot be used in the same layout. Because of difference in the height of the track as well as in length and curvature of the rails and the thickness of the

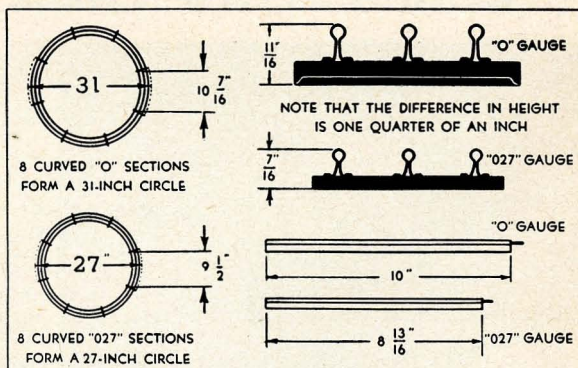


Figure 31—Comparison Between "O" and "027" Track

connecting rail pins, "Lionel "O" and 027" Track sections, switches and crossovers are not interchangeable. However, accessory equipment such as lights, stations and signals as well as most of the cars equipped with knuckle-type couplers can be used with both "O" and "027" layouts.

"O" gauge cars and locomotives are generally longer and heavier than those of the "027" line. While it is possible to run many of the "O" gauge locomotives on "027" track and vice-versa, the largest "O" gauge locomotives and cars will tend to become derailed on sharp "027" curves, while the smallest "027" locomotives tend to lose third rail contact momentarily on "O" gauge switches and crossings causing the reversing E-Unit to trip and stop the train.

LAYING THE TRACK

When laying your track be careful not to bend or distort the track sections or you may cause the train to derail. If you use screws or nails to fasten your track to a wooden platform, make sure not to screw it down too tightly. Track should be fastened down merely to prevent shifting—not to clamp it down to the base.

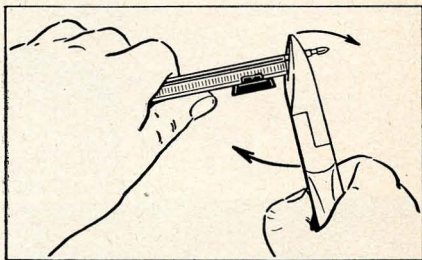


Figure 32—Removing Track Pins

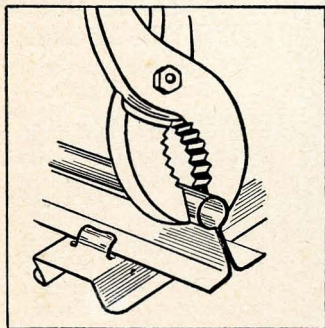


Fig. 33—Reducing Rail Opening

Where special lengths of track are needed use either Lionel's half-sections, available at your dealer, or cut the regular track sections to proper size. Use a jeweler's saw or a fine-toothed hacksaw. Smooth the cut edges with a fine file.

In many cases you may find it necessary to remove the steel pins from a track rail, either to place them into the opposite end of the rail or to replace them with fibre insulating pins. This can be done most easily with a pair of diagonal cutting pliers, as shown in Figure 32. Use the rail flanges as a lever point and work the pin out gradually. Try not to distort the rail.

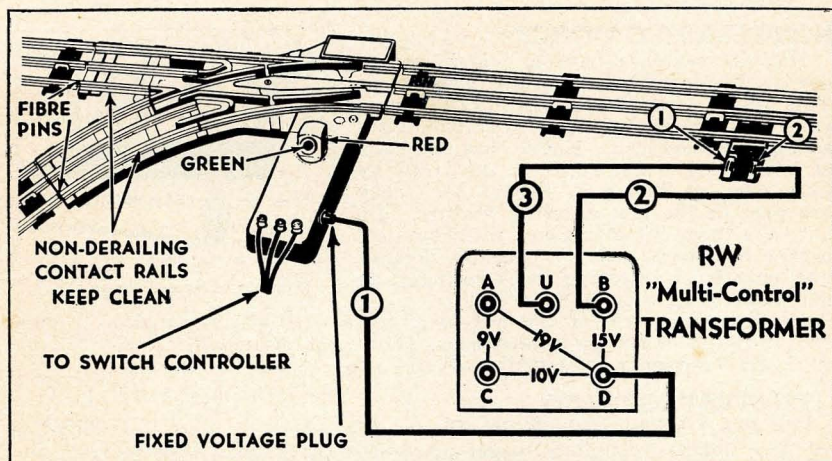


Figure 34—Installation for No. 022 Switch. For Other Transformers See Chart Below

If the openings in the rail have become enlarged causing pins to fit loosely reduce the openings by pinching the rail gently with a pair of pliers. Loose track connections may be a source of considerable loss of power, particularly in large layouts. Always replace missing pins.

TRACK SWITCHES

Track switches are used to join two lines of track and to enable the train to cross from one line to another. Switches are inserted in the layout in the same way as any regular section of track. To keep the level of the track even do not fasten down the track sections adjacent to the switch. No. 022 and No. 042 switches are used in "O" gauge layouts; No. 1121 and No. 1024 switches in "027" layouts. Switches are generally sold in pairs consisting of a right-hand and a left-hand switch.

No. 022 REMOTE CONTROL SWITCH

No. 022 switches are operated by controllers connected to the switch by 3-wire cables. Connect the center wire to the middle binding post of the switch. Connect the outside wires to the outside binding posts.

When the switch is properly installed, moving the controller lever throws the swivel rails of the switch either to permit the train to go along the straight-away, or to turn it onto the curved portion of the track. The switch and the controller are equipped with red and green lights which indicate the position of the swivel rail. When the switch is set for the train to go along the straight-away, green light shines in the controller and along the straight-away; when switch is set for the train to go along the curved portion, red light shows in both places. If the wrong light shows in the switch take off the lamp cover and mount it correctly. If the lights in the switch and the controller do not correspond interchange the two outside connecting wires.

Lights in the controller enable you to tell the position of the switch even if it is out of sight.

TRANSFORMER	TRANSFORMER CONNECTIONS					
	LOW TRACK VOLTAGE			HIGH TRACK VOLTAGE		
	WIRE No.1	WIRE No.2	WIRE No.3	WIRE No.1	WIRE No.2	WIRE No.3
No. 1033	NOT USED	B	U	C	A	U
RW	D	B	U	D	A	U
VW & ZW	B OR C	U	A OR D			
RX	D	B	U	D	A	U

Fig. 35—Connections to Various Transformers

NON-DERAILING DEVICE

No. 022 switches have a built-in safety device which prevents train derailment. This device automatically throws the swivel rails to the correct position to accommodate an approaching train. Notice that two rails of switch are insulated from the track by fibre pins, as shown in Figure 34. They are part of the non-derailing feature. Do not take them out or replace them by steel pins or the switch will not operate. Remove pins only from adjoining track sections; do not disturb the switch.

An interesting use of the non-derailing device is illustrated in Figure 37. If the switches are connected as shown the train will alternate automatically between tracks "A" and "B."

FIXED VOLTAGE PLUG

The Fixed Voltage Plug (See Figure 36) which is furnished with 022 switches makes it possible to get power for the switch directly from the transformer. Push the plug carefully over the booster pin in the socket on the side of switch and wire it directly to the transformer. This insures a constant voltage supply independent of the variable track voltage. (See Figure 31 for proper transformer connections). A constant voltage of 12-15 volts should be used to obtain snappy switching action.

The use of the Fixed Voltage Plug is optional. In small layouts it may not be necessary, for the switches will operate satisfactorily by drawing the current directly from the track. Pulling out the Fixed Voltage Plug automatically connects the switch mechanism to the track voltage supply.

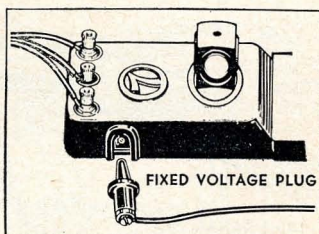


Fig. 36—Fixed Voltage Plug

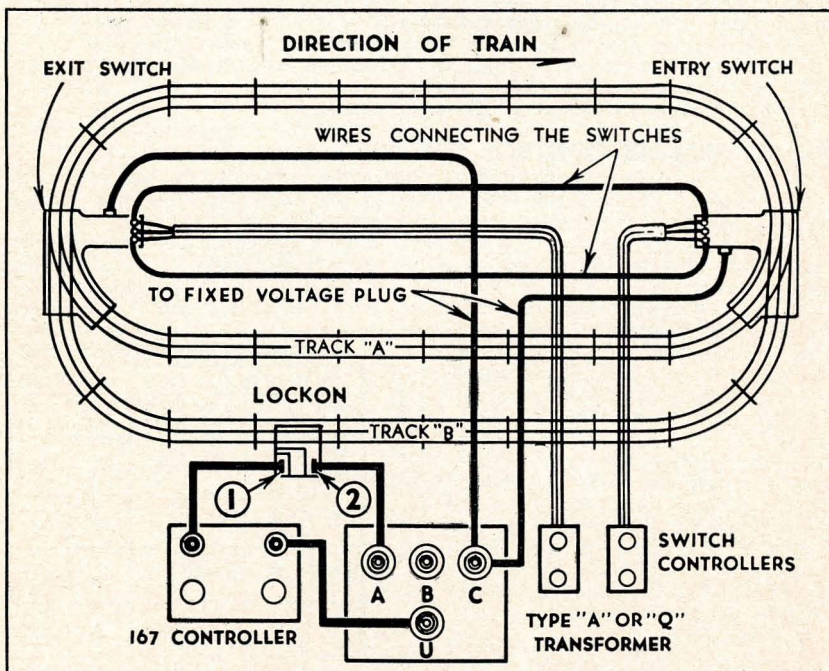


Figure 37—Layout for Automatic Switching of Train

REVERSING SWITCH MOTOR

The position of the "motor" unit in 022 and 042 switches can be changed from one side to the other, if necessary for a particular layout. Remove the two mounting screws indicated by "A" in Figure 38 and detach motor unit from the switch. Insert the motor in position on the opposite side as shown by dotted line. Make sure that the driving pin is properly inserted in slot of the swivel rail and replace the mounting screws. When reversing motor of 042 switch, the position of the lamp wire must be changed to the opposite side of the motor.

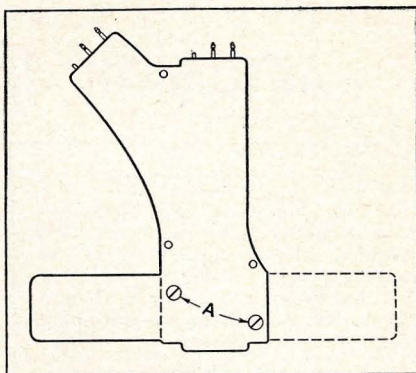


Figure 38—Reversing Switch Motor

No. 1121 REMOTE CONTROL SWITCH

No. 1121 Switches are intended for use with "027" gauge track. The procedure for installing these switches in the layout and connecting them to their controller is the same as for No. 022 Switches. No. 1121 Switches do not have a Fixed Voltage Plug but draw their power directly from the track.

While No. 1121 Switches do not have a built-in non-derailing device, they can be made to operate automatically by a simple installation illustrated in Figure 39. Two No. 1045C Contactors are required for each switch. The contactors are clamped to straight track sections adjoining the two exit branches of the switch and are then connected to the terminals on the switch box, as shown in the diagram. Note that connectors clamped to the curved branches are wired to the right-hand switch terminals; those connected to straight-aways, to the left-hand terminals.

When proper connections are made, the wheels of the locomotive approaching an "open" switch automatically make the necessary electrical connection to throw the switch to correct position in order to prevent derailment. By varying the position and connection of contactors any switch in the layout can be made to operate automatically, opening and closing sidings and branch lines and routing trains according to a prearranged schedule.

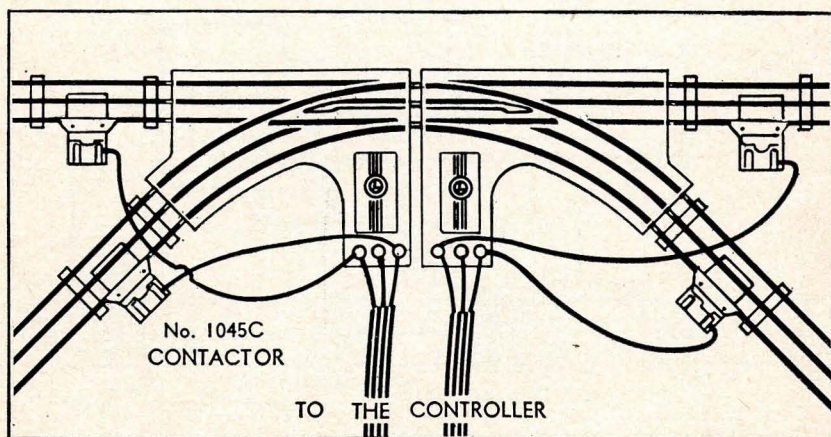


Figure 39—How to Connect No. 1121 Switches for Non-Derailing Operation

AUTOMATIC TRACK SIGNALS

No. 153C CONTACTOR

Several model railroad track signals made by Lionel are operated automatically by the weight of the passing train. Among these are: No. 45 Gateman, No. 151 Semaphore, No. 152 Crossing Gate and No. 153 Block Signal.

All of these signals are controlled by means of the No. 153C Contactor which is supplied with the signal. Place the contactor underneath the track so that one track tie rests firmly upon the top of the contactor. See Figure 40.

Do not fasten down the track for several sections on either side of the contactor because the track must remain sufficiently flexible to bend under the weight of the train. Connect your accessory to the contactor clips as shown in the diagrams. After all connections are made and the transformer power is on, adjust the contactor as follows: With the train stopped on track several sections away from the contactor, turn the adjustment nut either up or down until the accessory operates, then turn the nut back just enough to return the accessory to its normal non-operating position. When the contactor is adjusted properly, the accessory should respond to a light finger pressure on the track over the contactor.

Notice that these signals are connected directly to the appropriate fixed voltage terminals of the transformer. No. 153C Contactor has no electrical connection to the track, but acts merely as a convenient pressure-operated switch. All of the automatic track signals operate on 10-12 volts.

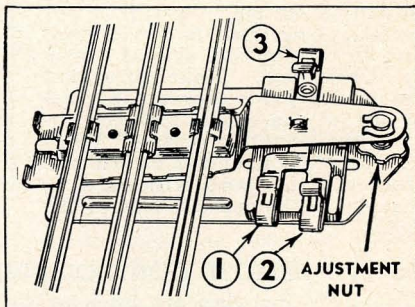


Figure 40—How to Install No. 153C Contactor

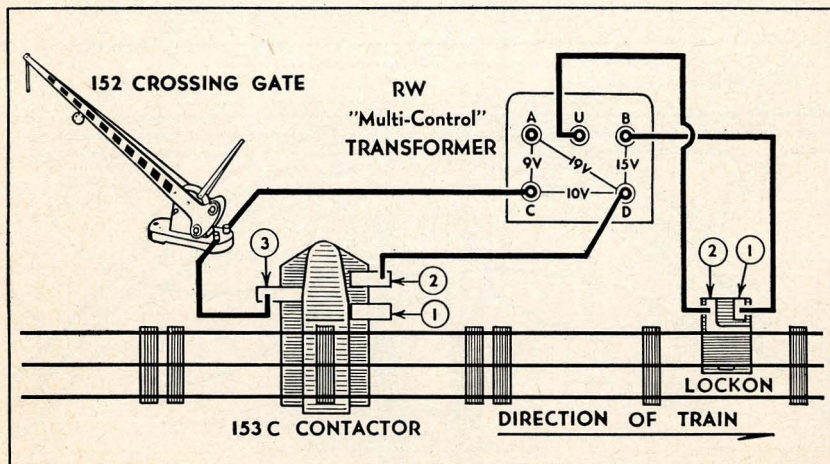


Figure 41—How to Connect Crossing Gate or No. 45 Gateman

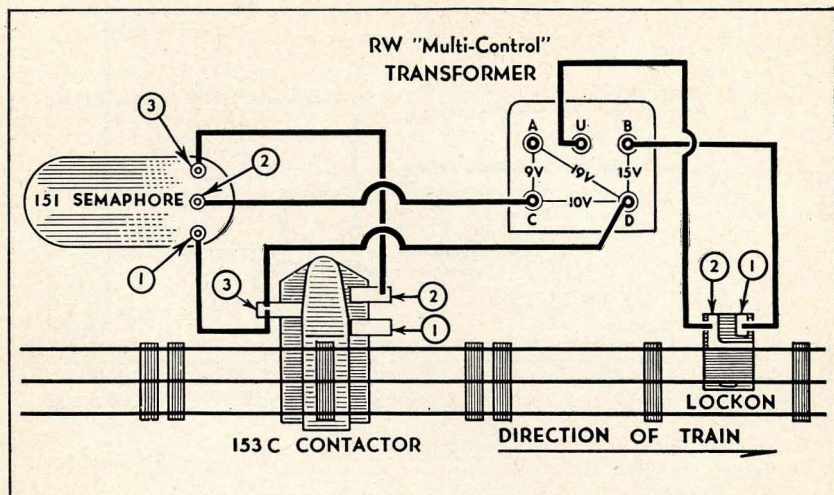


Figure 42—How to Connect No. 151 Semaphore

No. 151 SEMAPHORE AND No. 153 BLOCK SIGNAL

To operate No. 151 Semaphore or No. 153 Block Signal install the 153C contactor as described before and connect the wires as shown. In 151 Semaphore the light burns continuously, shining either through the green or the red lens depending on the position of the semaphore arm. The arm should go down as the train passes over the contactor. In 153 Block Signal, which has two separate lamps, the green light goes out and the red goes on as the train passes over the contactor.

Although the diagrams on these pages show a separate contactor for each signal, several signals can be connected to the same contactor so that the passage of the train simultaneously operates several accessories placed at different places in the layout.

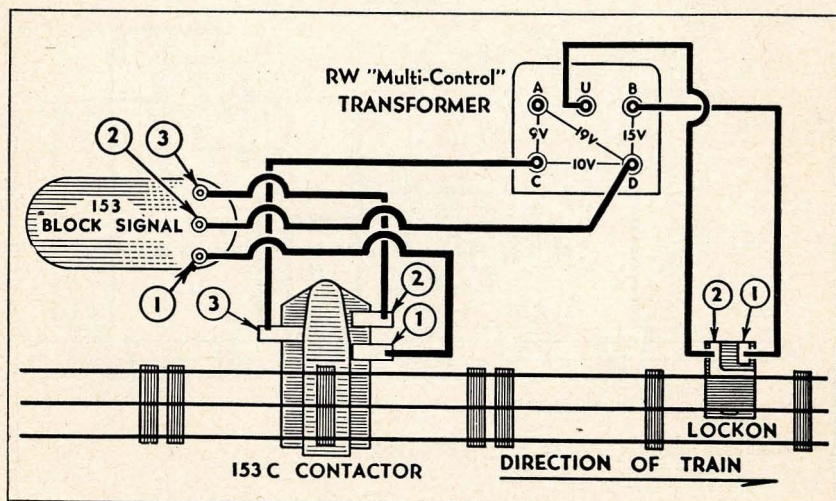


Figure 43—How to Connect No. 153 Block Signal

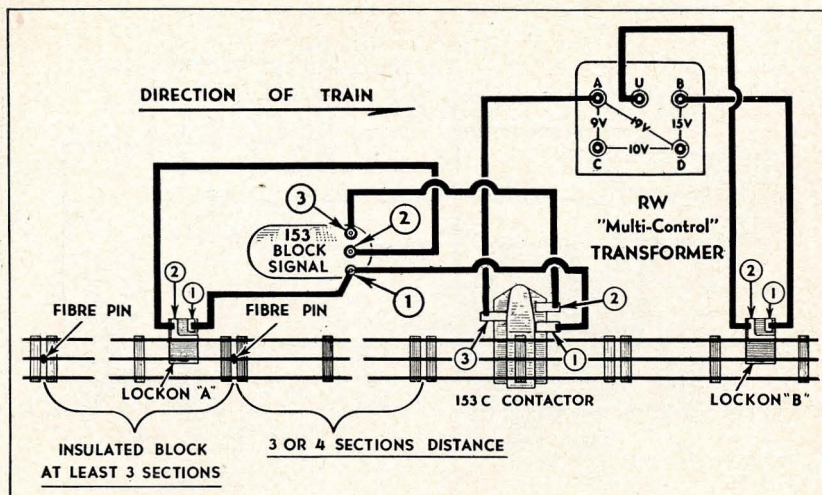


Figure 44—How to Run Two Trains with No. 153 Block Signal

OPERATING TWO TRAINS

By installing an insulated track block and using a 153C Contactor it is possible to operate two trains simultaneously on the same layout. Generally either a Block Signal or a Semaphore is used with an installation of this type as shown in the diagrams on this page. Be careful to make all wiring connections exactly as shown. Note particularly that a portion of track at least three sections in length is partially insulated from the rest of the track by means of fibre pins inserted in the center rails at the ends of the block. If the installation is properly made, the following action will result:

Train No. 1 crosses the contactor, changing the position of the track signal to indicate "Stop" and at the same time cutting the power out of the

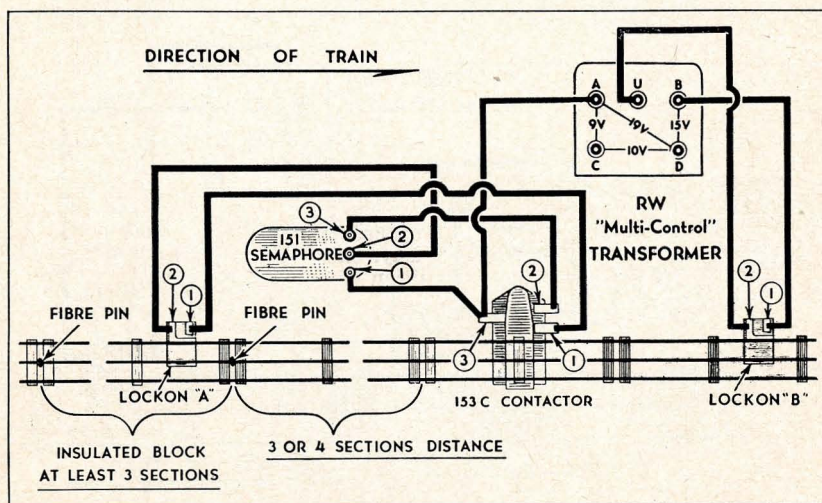


Figure 45—How to Run Two Trains with No. 151 Semaphore

insulated block. Train No. 2, running behind the first train, runs onto the insulated block and stops. After the last car of train No. 1 has passed over the contactor, the track signal changes to "Go" position and current flows back into the insulated block allowing train No. 2, waiting in the insulated block, to continue on its way. Of course if train No. 2 is far enough behind train No. 1, it will move through the insulated block without stopping.

In order to give the waiting train a fast start, voltage supplied to the insulated block through Lockon "A" and 153C Contactor should be 2 to 3 volts higher than the voltage supplied to the rest of the layout through Lockon "B".

NOTE: When operating two trains in this way don't forget to disconnect their automatic reversing mechanism as described on page 6. Otherwise the trains, after being stopped, will not resume forward motion but will remain standing in "neutral."

Two of the many possible layouts using the 153C Contactor and insulated blocks for operating two trains are shown in Figure 46. You will notice that the basic wiring of these layouts is the same as shown in Figure 44. When using a 151 Semaphore follow the wiring in Figure 45. While these diagrams all show connections made to a Type RW transformer, other transformers can be used as well. The proper connections for most modern Lionel transformers are shown in Figure 47.

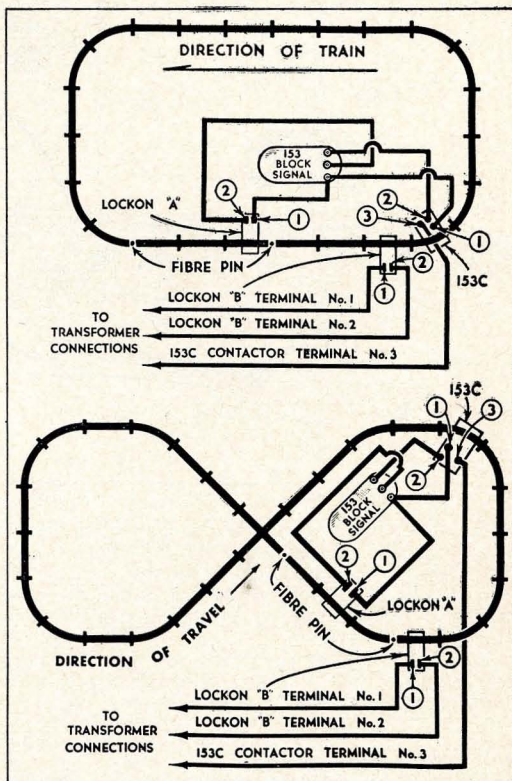


Figure 46—Typical Two-Train Layouts

Transformer Type	Lockon "B" Terminal No. 1	Lockon "B" Terminal No. 2	153 Contactor Terminal No. 3
1032, 1033, 1034 1041, 1042, "RW"	U	B	A
"VW" and "ZW"	U	A or D	B or C
"S"	A or B	U	C
"R"	A or B through 167	C	F
"V" and "Z"	U	C or D through 167	B or C

Figure 47—Transformer Connections for Two-Train Operation

No. 154 CROSSING SIGNAL

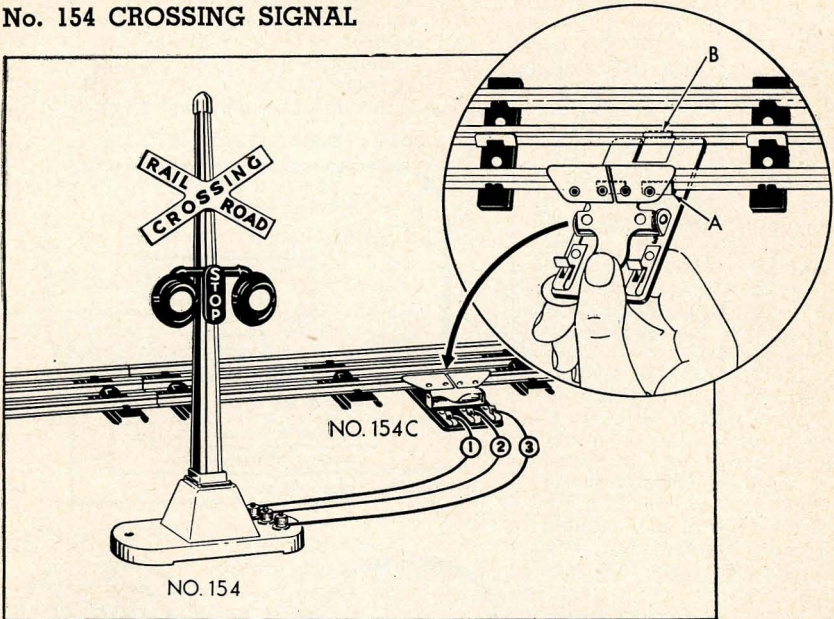


Figure 48—How to Install No. 154 Crossing Signal

No. 154 Crossing Signal is connected directly to the track by means of the No. 154C Contactor. Attach the contactor to the track by pressing down the spring lever to raise the contact plate as shown in the inset of Figure 48; then place contactor under the track with clip "A" gripping the flange of outside rail, snap spring clip "B" over the center rail, and release the spring lever.

As the wheels of the train roll over the contactor surface, the red warning lights of the Crossing Signal will blink alternately. Keep wheels of train, track rails, and top of contactor clean and free of rust, dirt or grease.

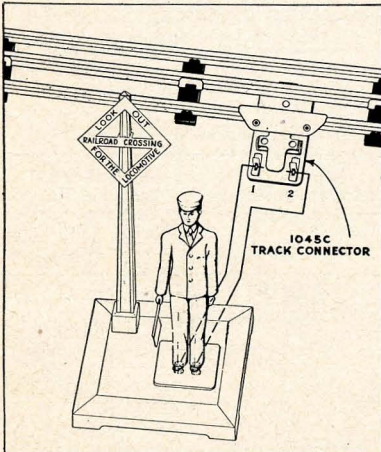


Fig. 49—Connecting the Operating Flagman

No. 1045 FLAGMAN

An accessory somewhat similar in operation to No. 154 Crossing Signal is No. 1045 Operating Flagman, who waves a warning flag as the train goes by a crossing.

The Flagman is connected directly to the track by means of the No. 1045C Contactor which is clamped on to any section of straight track in the same way as No. 154C Contactor. No. 1045 Flagman and its track connections are shown in Figure 49. You will notice that the inside of contact plate of both 1045C and 154C Contactors has a layer of insulating paper. This layer keeps the electrical circuit normally open. Whenever a car truck passes over the contactor the circuit is completed through the car wheels and the flagman operates.

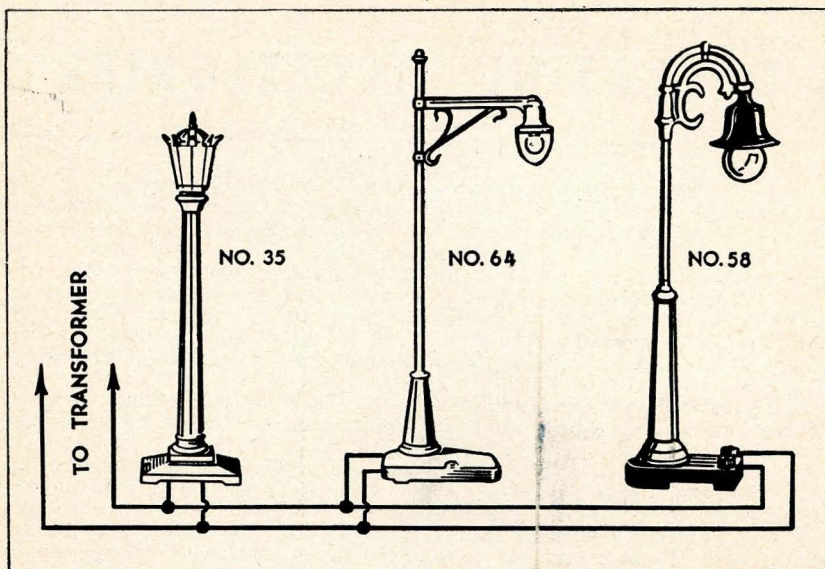


Figure 50—"Parallel" Wiring of Illuminated Accessories

ILLUMINATED ACCESSORIES

A wide variety of Lionel illuminated accessories, such as lamp posts, station platforms, floodlights, beacons, and other realistic pieces of model railroad equipment, is available. The voltage required by various illuminated accessories depends upon the lamps used. With few exceptions it is generally 12-14 volts.

Illuminated accessories should be connected directly to the transformer whenever possible. After you have found what voltage is required, (See Page 39) select the pair of binding posts which give nearest to the required voltage and connect them to the binding posts or contact clips of the accessory. In the event you have several illuminated accessories requiring the same voltage it is advisable to use the same pair of transformer binding posts for all of them, wiring them together in "parallel" as shown in Figure 50. Two main feeders go to the transformer posts and individual wires from these feeders to the accessories. In this way unnecessary wiring is eliminated.

Remember that if two or more 14-volt accessories are wired together in "parallel", they must still be connected to the 14-volt posts on the transformer and not to posts which give the total of the voltages required by individual accessories.

When illuminated accessories are connected to binding posts whose voltage is not "fixed" but is controlled by dials, such as in transformers VW or ZW, take care not to turn the voltage control to a point greater than specified for the accessories, or the lamps will be quickly burned out. As a general rule the life of the lamps will be greatly extended if they are operated a little below their rated voltage.

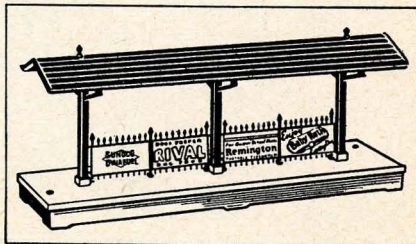


Figure 51—Station Platform

OPERATING ACCESSORIES

Lionel manufactures a number of realistic operating accessories which duplicate the activity of real railroad equipment. All of these accessories depend on the transformer for their operating power and work on voltages ranging from 10 to 14 volts, depending upon the accessory itself. The higher portion of this range is generally required when the motor and the working parts of the accessory are new, but the voltage can usually be decreased as the mechanism become worn in. It is good practice to run any Lionel operating accessory on the lowest possible voltage. In this way you will prevent unnecessary wear and prolong the life of the equipment.

While variable voltage is supplied to the track for controlling the speed of the train, the majority of operating accessories should be connected directly to the fixed voltage terminals of the transformer. Select that combination of terminals which furnishes the proper voltage for operating your accessory. (See page 39.) When using a Type V or Z Trainmaster transformer, or a VW or ZW Multi-Control transformer, where the voltage for operating accessories as well as that for running trains may be set at any desired point, turn the voltage control to the lowest voltage where you get satisfactory operation.

The number of operating accessories which can be used with your model railroad is limited only by the wattage rating of your transformer as discussed in the section on Power Supply.

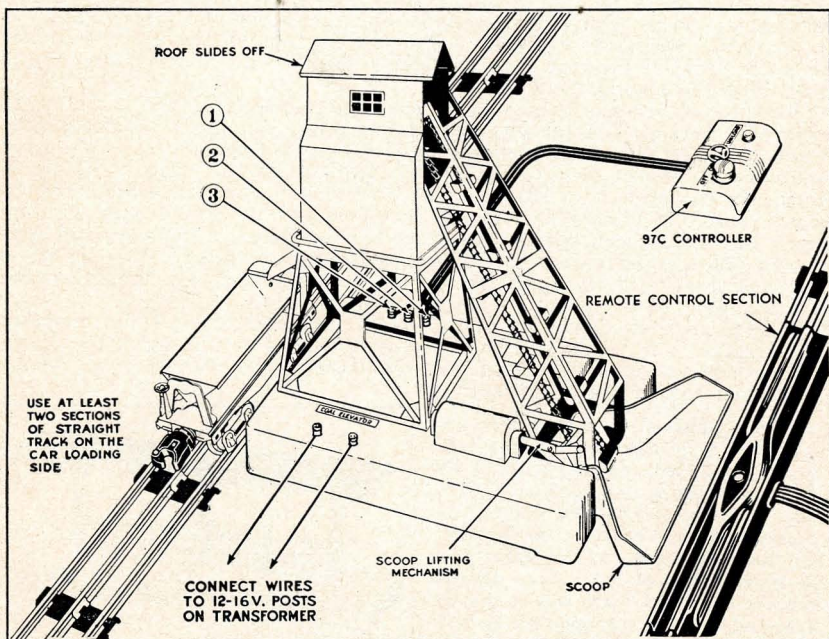


Figure 52—Installation for No. 97 Coal Elevator

No. 97 COAL ELEVATOR

Lionel No. 97 Coal Elevator is installed between two lines of track approximately 14 inches apart with a remote control section inserted in one of the lines. See Figures 52 and 53. Lionel artificial coal can then be unloaded from dump cars into the automatic tilting scoop of the elevator where it is picked up by the bucket conveyor and carried to the storage bin on the top of the elevator. The car is then rerouted beneath the delivery chute on the other side of the elevator and there reloaded. No. 97C Controller supplied with the elevator has a button for controlling the gate of the elevator storage bin and an "On-Off" switch for controlling the motor-driven bucket conveyor.

WARNING

Only Lionel Artificial Coal should be used in the accessory. Any other material may clog or bind the conveyor belt.

The motor of the Coal Elevator should be lubricated periodically paying particular attention to the ends of the armature shaft. However, the sprockets or any other part of the conveyor should never be lubricated or pieces of coal will stick to it and jam the conveyor mechanism.

No. 164 LUMBER LOADER

Similar in operation to No. 97 Coal Elevator is No. 164 Lumber Loader illustrated in Figure 54. The Lumber Loader is placed in a layout similar to that used for the Coal Loader. It is especially appropriate for use with remote control Lumber Cars. These cars will unload lumber into the bin on one side of the Loader. The Lumber is then picked up by the conveyor chain and transported to the upper storage platform. Pressing the "Unload" button on 97C Controller will release stored lumber into waiting lumber cars. Like the Coal Elevator, the Lumber Loader should be connected to fixed voltage transformer posts furnishing 12-16 volts.



Fig. 53—Typical Layout for Coal Elevator or Lumber Loader

TRACK NEEDED: 13 sections of straight track, 14 sections of curved track, 1 pair of switches, 1 Remote Control Section.

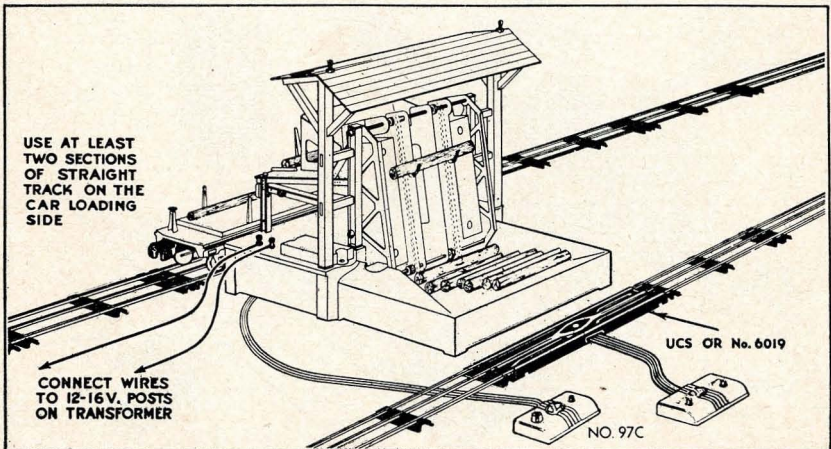


Figure 54—How to Install No. 164 Lumber Loader

No. 364 LUMBER LOADER AND No. 397 COAL LOADER

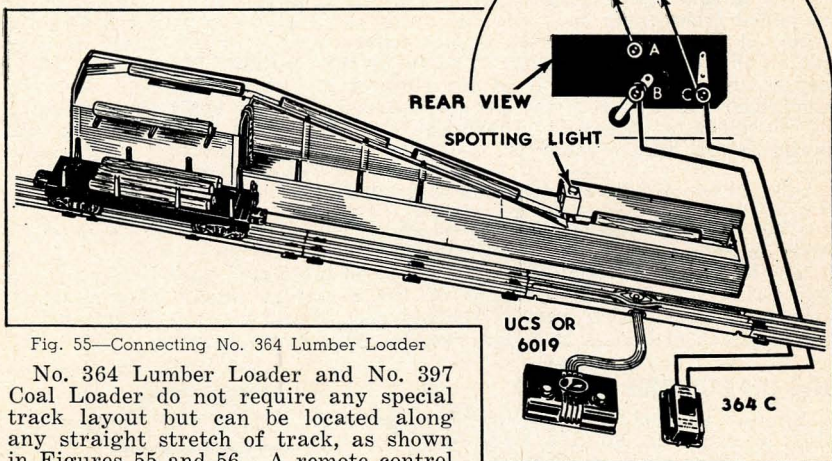


Fig. 55—Connecting No. 364 Lumber Loader

No. 364 Lumber Loader and No. 397 Coal Loader do not require any special track layout but can be located along any straight stretch of track, as shown in Figures 55 and 56. A remote control section is placed in front of the accessories in such a way that operating lumber or coal cars can be unloaded into the receiving bins. Motorized conveyor belts then carry the material from these bins and reload it into the waiting empties. Note that in the case of the Coal Loader the coal car is loaded and unloaded from the same position on the Remote Control Section, while in the case of the Lumber Loader the empty car must be moved over to the loading station in order to be reloaded. Adjust the location of the accessories until you obtain good loading and unloading action.

The conveyor belts in both the Lumber and the Coal Loaders are started and stopped by means of the 364C Controller, shown in Figure 56.

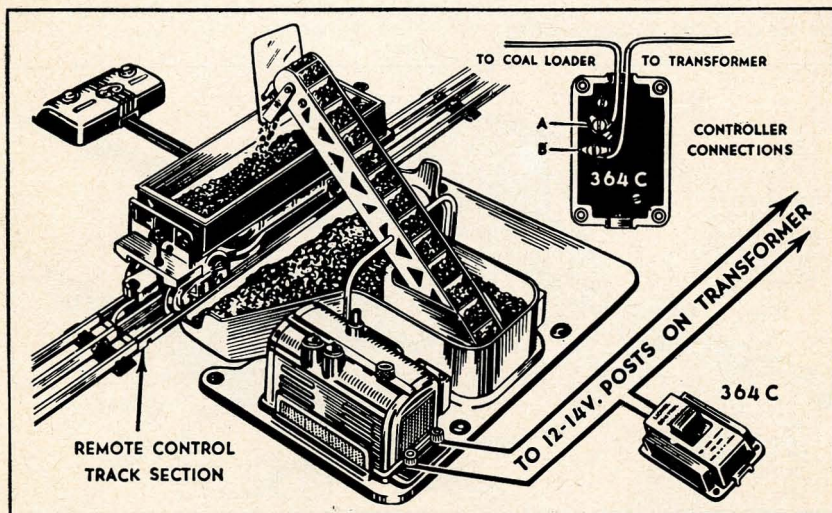


Figure 56—Connection for No. 397 Coal Loader and Its Controller

No. 182 ELECTROMAGNETIC CRANE

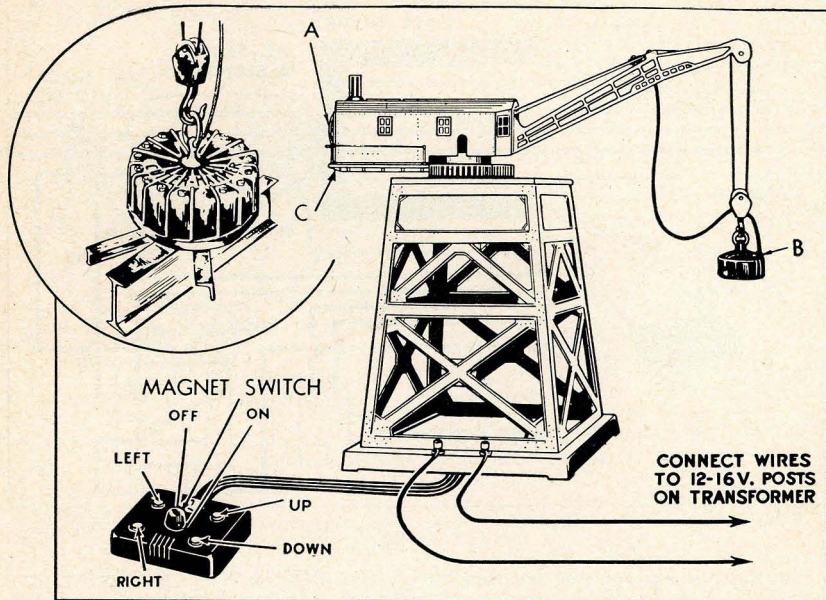


Figure 57—No. 182 Electromagnetic Crane

No. 182 Electromagnetic Crane performs all of the operations of a real crane, picking up loads of iron and steel and transporting them to waiting flat cars. The No. 165C Controller, attached to the Crane by cable, has four push buttons and a central rotary knob switch. Each one controls a different Crane action, as shown in Figure 57. Upper left hand button rotates the cab and boom assembly in a counter-clockwise direction; the lower left hand button controls rotation in the opposite, or clockwise, direction. The upper right hand button raises the magnet attached to the block and tackle; the lower right hand button lowers the magnet. Only the two top or the two bottom buttons can be pressed simultaneously. Any other combination will stall the motor.

You will notice that the cord holding the hook slowly shortens as the cab is rotated clockwise and lengthens as the cab is turned in the opposite direction. For this reason do not rotate the cab continuously in the same direction or the cord will eventually wind up tightly and jam the mechanism.

The central knob switch energizes the electromagnet, enabling it to lift pieces of steel, iron nails, etc. A red light in the cab indicates when the magnet is energized. To pick up a load merely lower the magnet into a pile of iron or steel, then energize the magnet by turning switch to "on", lift and carry the load to its destination, turn switch "off" and the load drops from the magnet. The magnet should be "on" only when carrying loads. Turn it off at all other times to prevent overheating. The position of the boom can be raised or lowered by means of the hand-wheel at rear of cab, indicated as "A" in the illustration.

Should the red light in the cab burn out remove cab by unscrewing the boom-control wheel "A" and the two screws under the rear part of the cab, indicated by "C."

No. 313 ELECTRIC BASCULE BRIDGE

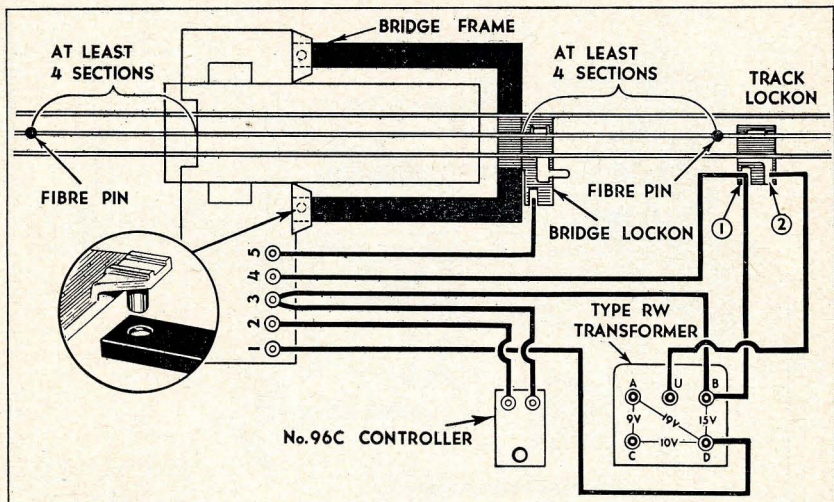


Figure 58—Installation for Bascule Bridge. For Connections to Other Transformers See Chart Below

The Bascule Bridge can be used with either "O" or "027" gauge layouts. For "O" gauge, four 1/4" spacers furnished with the bridge are screwed into the base of the bridge to bring it up to the level of the "O" gauge track. For "027" gauge, the special short piece of track must be inserted into the layout opposite to the bridge to compensate for the extra length of the bridge.

The bridge must be assembled to its frame (See Figure 58) in order to line it up accurately with the track. The bridge lockon is clamped to the first regular track section. Note that at least four sections at each end of the bridge are insulated from the rest of the layout by means of fibre pins inserted in the center rail.

When the bridge is properly installed and wired, as shown above, it can be operated in this way: Just before the train approaches the insulated area, on either side of the bridge, press the button on No. 96 controller. Hold button down 2 or 3 seconds until the bridge starts to rise. As bridge span rises, the train will stop in the insulated area and wait for the bridge to come down. After the track level is normal again, the waiting train starts automatically.

NOTE: When operating train with the Bascule Bridge disconnect the locomotive reversing unit. Otherwise it will trip to neutral position as the train enters the insulated block and the train will not restart.

CONNECTIONS		TRANSFORMER						
		1032-1033	RW	VW-ZW	A*-Q**	S	R**	V**-Z**
TRACK	LOCKON CLIP No. 1	U	U	A or D	U	U	F	C or D
	LOCKON CLIP No. 2	A* or B	A* or B	U	B	A* or B	A* or B	U
BRIDGE	BINDING POST No. 1	A	A* or B	U	A	A* or B	A* or B	U
	BINDING POST No. 3	C	D	B or C at 16-18 volts	C	C	C	A or B at 15-16 volts

* Post A will give higher voltage than B.

** For transformers used with 167 Whistle Controller, connect Lockon Clip No. 2 to one of the 167 posts and the other 167 post to the designated transformer post.

No. 115 AND No. 132 PASSENGER STATIONS

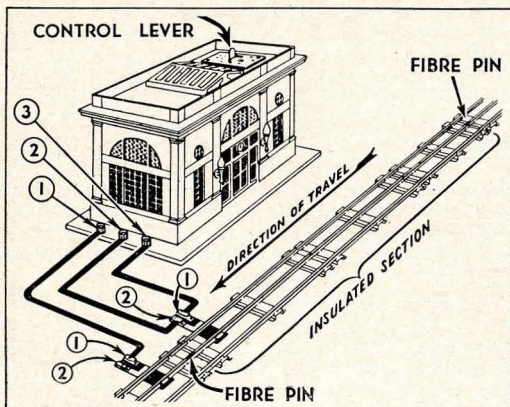


Figure 59—Installing Automatic Station

installation, one placed inside and one outside the insulated block. The length of time that a train remains standing in front of the station is regulated by the control lever located on the roof of the No. 115 station. To reach the control in No. 132 Station lift off the roof. The simplest way to adjust the station is to start from CONTINUOUS position and gradually move the lever toward SLOW. Allow the train to make several circuits in each position before moving the adjustment lever to a new position.

NOTE: When operating the train with an automatic train control station in the layout disconnect the reversing unit in the locomotive. Otherwise the unit will trip to neutral position when the train enters the insulated block so that the train will not restart.

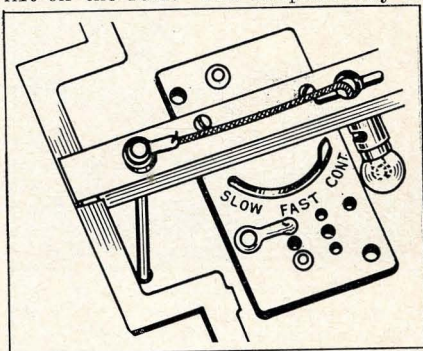


Figure 60—Train Control in No. 132 Station

No. 30 WATER TOWER

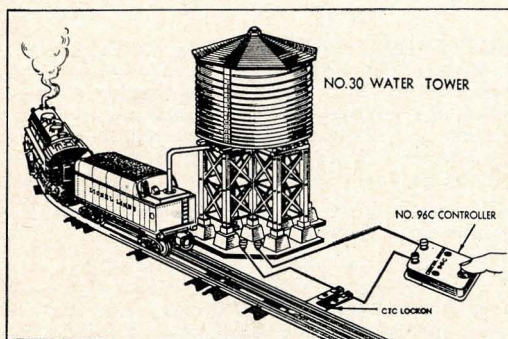


Figure 61—How to Connect Water Tower

No. 30 Water Tower is wired either to a pair of fixed voltage terminals of a transformer or directly to track by means of a Lockon. (See Fig. 61).

To operate the Water Tower press No. 96C Controller button. The spout will drop to "fill" the water tank in the tender. When the button is released the spout will lift. If operation of water tower is sluggish raise track voltage slightly before pushing button.

POWER SUPPLY

HOUSEHOLD POWER LINES

Lionel electric trains and accessories operate on low voltage ranging from 8 volts to 18 volts, depending on the type and size of the locomotive and train and on the rated voltage of the lamps used in illuminated accessories. This low voltage is generally stepped down from the regular house power lines by means of a Lionel transformer.

While the house power supply used in this country is usually 110 to 125 volts, 60-cycle alternating current (AC), there are a number of exceptions. Some parts of California use 50-cycle current; some areas in Canada employ 25-cycle current, while some downtown areas in New York City still use 110-volt direct current (DC) with which a transformer cannot be used without a special DC-to-AC *inverter*.

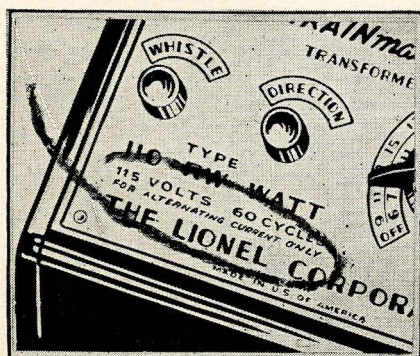


Figure 62—Transformer Rating

ing any equipment which is to be plugged into your wall outlets. If you have a special problem consult your Lionel Dealer or write to The Lionel Corporation.

D.C. OPERATION

Most Lionel equipment can also be operated on low voltage direct current, which can be obtained either from automobile storage batteries or from 32-volt d.c. generators sometimes used in rural areas where regular electric power is not available. When direct current is used trains require less voltage than when operated on regular alternating current obtained from a toy transformer. Two storage batteries in series generally furnish enough voltage, which is varied for controlling train speed by means of a rheostat.

If a 32-volt source is used the voltage must be reduced to approximately 12 volts by means of series resistance or a potentiometer.

As previously stated, Lionel train whistles cannot be controlled but will blow continuously when the train is operated with direct current or with alternating current having a frequency of less than 40 cycles. For further information on low-voltage d.c. operation write to Lionel Engineering Department.

ABOUT WATTAGE

In addition to their voltage and frequency rating, all transformers also bear a wattage rating. The wattage of a transformer corresponds to its *capacity*, or ability to furnish power. While the voltage and frequency of the transformer you must use are determined by the available power line, the selection of its wattage is guided by the size of your outfit and the number of lights and operating accessories. In planning to expand your railroad always estimate the power you will need to find out if your transformer will be adequate. *It is always wisest to get a transformer larger than the one you require for your immediate needs to provide power for future expansion.*

As a transformer becomes warm when in use its output normally diminishes. Because of this fact not more than three-quarters of its rated wattage should be drawn from a transformer continuously.

The following table lists the power in watts used by various model railroad components:

"027" gauge locomotive	25-35*
"O" gauge locomotive	30-40*
Smoke generator	5
Operating accessories	10-40
Automatic track signals	10-15
Each 6-volt lamp	1.5
Each 14-volt lamp (small)	2.
Each 14-volt lamp (large)	3.
Each 18-volt lamp	5.

* These wattages are drawn by locomotives when pulling the regular number of cars and include the power used by the whistle. However, you must add the power used by lamps in illuminated cars.

Power requirements of automatic couplers and operating cars need not be added in the total since couplers draw current only for an instant and operating cars only when the train is not running. For the same reason do not add the power used by such accessories as the Lumber and Coal Loaders, Electromagnetic Crane, and others. All such accessories can be generally used even with the smallest transformers, provided that they are operated when the train is standing still.

Accessory lights and equipment containing steadily burning lamps, such as switches and switch controllers, use a considerable amount of power and should be added in the total power requirements.

The following table can be used as a guide for the selection of additional accessories for your outfit or for a more adequate transformer for your railroad system.

Transformer	Capacity	Recommended for Operating the Following
1033	90 watts	One "027" outfit with smoke and whistle; few track or signal accessories.
RW	110 watts	Any "O" outfit with smoke and whistle; few switches and other accessories.
VW	150 watts	Two "O" outfits with smoke, whistle, switches and other accessories.
ZW	250 watts	Any practical railroad system with two or more trains, etc.

ABOUT VOLTAGE

A few words about voltage may help you understand the operation of your transformer so that you can use it to the best advantage. The "fixed" voltages marked on your transformer panel or the voltages indicated by your transformer voltage control at any particular setting are almost never the actual voltages delivered to your track or your accessories. The reasons for this variation are several. The voltages marked on your transformers are "nominal". That is, they are accurate only under certain specified conditions: when the line voltage fed into your transformer is just 115 volts and when *no current is drawn* from the transformer. Actually, the line voltages may vary from 125 to 110 volts, or even lower, depending on the standards in your locality and on how much electricity is being used at a particular time. This variation, naturally, results in a comparable variation in the output voltage of the transformer. If your train seems to run slower during a sudden storm it's probably because hundreds of people in your neighborhood had switched on their lights and so depressed the line voltage.

In the same way that a heavy demand for power may lower the voltage in your neighborhood, a heavy load on your transformer lowers *its* output voltage as well. For example, the fixed binding posts which are marked 14 volts may, under actual operating conditions deliver only 12 volts, or even less. In the case of a short circuit so much current is drawn from the transformer that its voltage drops to 2 or 3 volts—too low to operate the train or even light the lamps.

In addition to the voltage loss in the transformer itself, commonly called the "regulation" of the transformer, still further voltage losses occur in connecting wires. For this reason wiring of a large layout should be carefully planned. If a platform is used, the wiring is best located on the under surface of the platform. All wires should be as short as possible. To keep your wiring to a minimum, accessories which require the same voltage, should be ganged up in "parallel," as shown in Figure 50. This "feeder" system can be used for wiring operating accessories as well.

USING AUXILIARY LOCKONS

In operating large layouts it is frequently found that the train slows down when running on the portion of track farthest from the Lockon. This

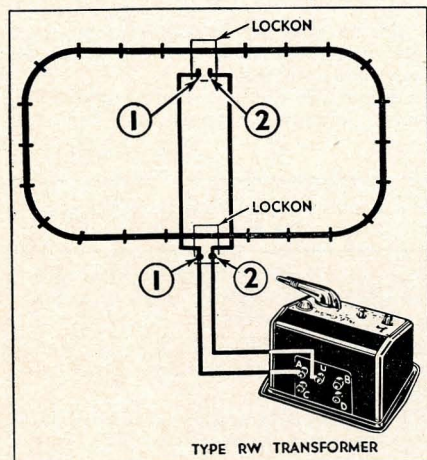


Figure 63—Using Auxiliary Lockons to Offset Voltage Losses

is due to voltage losses in the track itself and can be remedied by attaching additional Lockons at the points on the track where the train slows down. See Figure 63. Be careful to connect the No. 1 and No. 2 clips of the auxiliary Lockons to similarly numbered clips of the Lockon connected to the transformer or else a short circuit will result. Ordinary lamp cord is well suited to these connections as well as for "feeders" described above.

The main part of voltage losses in the track is due to loose track pins. These loose connections can be frequently detected by the heating effect of poor electrical contacts. After the layout has been in operation for a half hour or so, run your finger down the rails. Loose rail joints will then become apparent as hot spots on the track.

VOLTAGES REQUIRED BY ACCESSORIES

Because actual voltages may vary widely from the voltages indicated on binding posts, it is not practical to give a hard and fast rule for connecting accessories to a particular pair of transformer terminals. The actual working voltages required by the various Lionel accessories are given in chart below. The best practice is to connect the accessory to a pair of binding posts which give a slightly higher nominal voltage than its working voltage. If the accessory does not operate with enough pep shift to the next higher available voltage.

In wiring unusually large layouts many model railroaders use a separate transformer for supplying power for their lights and illuminated accessories. In this way, a large variation in the load of the main transformer does not effect the voltage supplied to the accessories.

HOW TO CONNECT ACCESSORIES

ILLUMINATED NON-OPERATING ACCESSORIES		
58 Lamp Post 64 Street Lamp 70 Floodlight 71 Lamp Post 315 Trestle 394 Beacon 156 Platform* 395 Floodlight*	12-14 volts	Use fixed voltage slightly lower than that specified to prolong lamp life. Accessories requiring the same voltage should be connected in parallel.
35 Boulevard Lamp 56 Lamp Post	18 volts	
* These accessories use two 6-8 volt lamps in "series". Both lamps will go out if one is burned out or loose.		
AUTOMATIC TRACK SIGNALS		
45 Gateman 151 Semaphore 153 Block Signal 152 Crossing Gate	10-12 volts	These accessories receive fixed voltage through No. 153C contactor.
154 Highway Signal 1045 Flagman	9-12 volts	These receive track voltage through special contactors.
TRACK-CONTROLLED OPERATING ACCESSORIES		
022 Switch	11-14 volts	Either track voltage or fixed voltage through Fixed Voltage Plug.
1121 Switch	9-12 volts	Track voltage.
115 Station 132 Station	10-12 volts	Track voltage through Lockons.
313 Bascule Bridge	10-14 volts	Track voltage and auxiliary fixed voltage.
TRACKSIDE OPERATING ACCESSORIES		
364 Lumber Loader 397 Coal Loader 164 Log Loader 97 Coal Elevator 182 Crane	10-14 volts	These accessories operate on fixed voltage. Since they use a fairly large current they are usually connected to posts having a nominal voltage from 12 to 16 volts. Parallel connections may be used.
30 Water Tower	9-12 volts	Track voltage through Lockon.

SERVICING LIONEL TRAINS

CLEANING YOUR EQUIPMENT

While serious repairs or overhauling which requires replacement of parts are best done by an Authorized Repairman, you can do a great deal yourself to keep your trains in good operating condition. The most important thing you can do to guarantee good operation and prevent unnecessary wear is to clean and lubricate your equipment regularly.

All parts of your outfit which serve as electrical contacting surfaces should be kept clean and free of oil or grease which might act as an insulator. These parts are the rolling surfaces of locomotive and car wheels, the contact rollers and sliders and the track itself. Dampen a clean cloth with carbon tetrachloride or other non-inflammable household cleaner, run it over the surface to be cleaned and then wipe dry with a clean cloth. If the rails have become rusted, good contacting surface should be restored by polishing with a piece of steel wool or fine emery cloth.

LUBRICATING LOCOMOTIVES

Lionel manufactures two different types of locomotive motors which require different treatment. The type shown in Figure 67 is mounted in the locomotive lengthwise, as illustrated in Figure 64, and contains a lubricant reservoir which is filled at the factory and which does not require frequent attention. Motors of this type are used in locomotives Nos. 622, 671, 726, 2020, 2332 and 2333.

In locomotives Nos. 671, 2020 and 726 the commutator of the motor armature is accessible for cleaning through a hole in the brush plate in the locomotive cab. In others the motor cannot be reached without removing the locomotive body. In all cases the body must be removed to reach lubricant reservoir, the location of which is shown in Figures 64 and 67.

Motors used in locomotives Nos. 675, 1655, 1656, 2025 and 2026 are mounted crosswise and do not have a reservoir to hold a supply of lubricant. These motors require more frequent lubrication. Apply a small amount of Lionel lubricant, as shown in Figure 6, or a drop of light machine oil on the end of a pin or toothpick. Do not use too much lubricant. Avoid getting oil or grease on the commutator surface or it will gather dust to form a sticky deposit in the commutator slots.

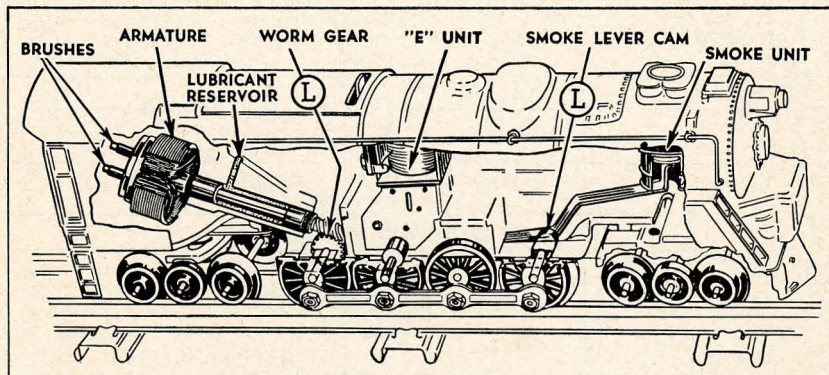


Figure 64—Cutaway View of No. 671 Locomotive Showing Working Parts. Parts Marked "L" Should Be Lubricated Occasionally

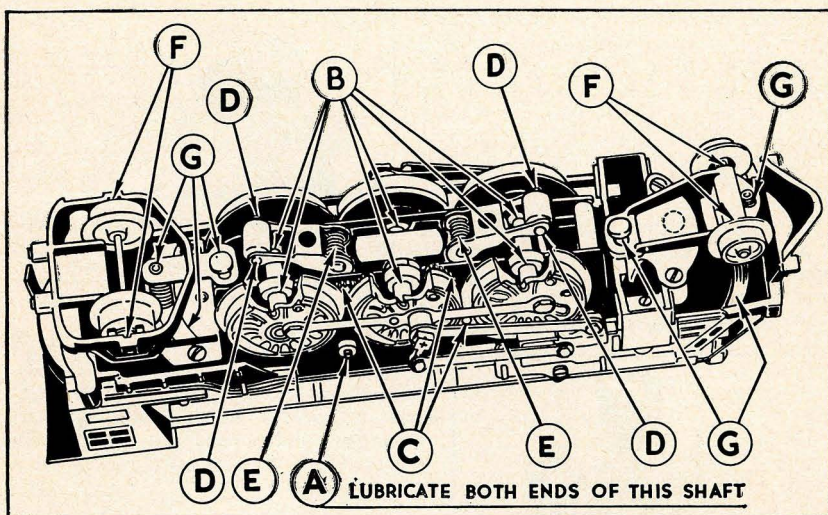


Figure 65—This Sketch Represents Locomotives Nos. 675, 1655, 1656, 2025 and 2026

- A—Armature shaft bearings (2)
- B—Wheel axle bearings (6)
- C—Gears and gear studs (3)
- D—Contact roller bearings (4)

- E—Roller bracket bearings (4)
- F—Pilot truck axle bearings (4)
- G—Pilot truck pivots and guides

Figures 65 and 66 show all the lubricating points on two typical Lionel locomotives. You will find that the wheel bearings indicated as B in Figure 65 and F in Figure 66 are difficult to reach. These bearings are made of special oil-retaining material which does not need frequent lubrication. An occasional drop of good machine oil on the end of a needle or toothpick is all that is necessary to keep these bearings well lubricated.

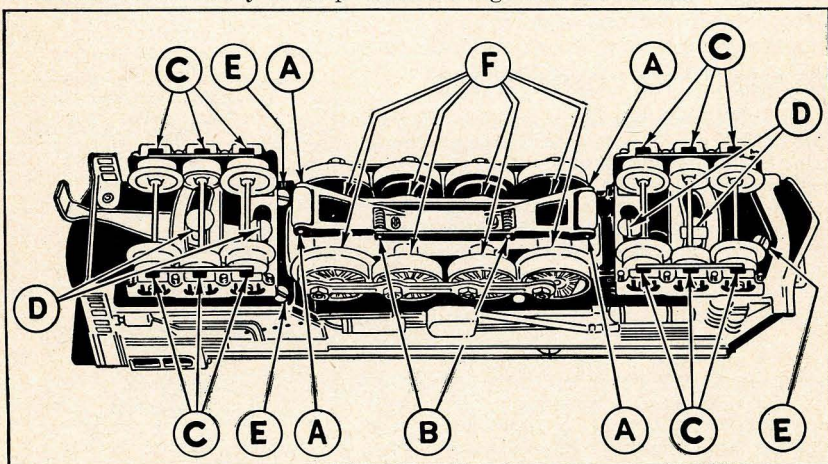


Figure 66—This Sketch is Typical of Locomotives Nos. 671, 726, 2020, 2332 and 2333

- A—Contact roller bearings (4)
- B—Contact roller brackets (4)
- C—Pilot truck wheel bearings (12)

- D—Pilot truck pivots and guides
- F—Wheel axle bearings

To lubricate motor shown in Figure 67 remove 3 screws marked "E" and lift off locomotive body.

When lubricating locomotives and other Lionel equipment be careful not to get any oil or grease on the driving surfaces of locomotive wheels or on the track, or the locomotive wheels will slip on the track and fail to pull the train. If any oil gets on the track clean it off with a clean cloth dampened with carbon tetrachloride (Carbona) or other household cleaner.

Remember to lubricate axles of car wheels and the contact roller bearings shown at A and B in Figure 68. Also do not neglect the motors con-

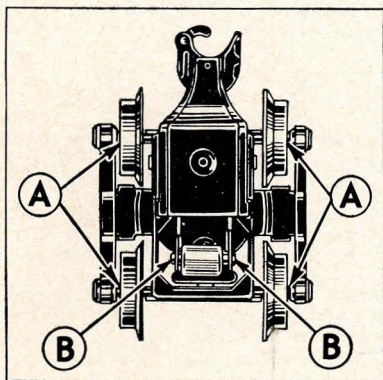


Figure 68—Underside of Car Truck. Lubricate Axle Bearings (A) and Roller Bearings (B)

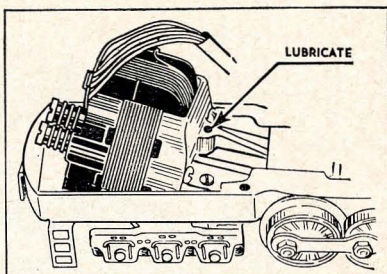


Figure 67—Lubricating No. 671 Motor

tained in such equipment as the Coal Loader, the Log Loader and the Bascule Bridge. Remember that the important points to lubricate are the armature shafts and the bearings in which they revolve.

In those accessories where the motor or other moving parts which need lubrication are difficult to reach, as in the case of No. 182 Electromagnetic Crane, a piece of wire, bent to the proper shape, makes a convenient instrument to carry a drop of oil to the desired spot.

Note: Do not lubricate to excess. A little lubricant or a drop of oil properly applied goes a long way.

CLEANING THE COMMUTATOR

Sluggish and uneven operation of your locomotive may be due to a dirty commutator. The commutator is the segmented copper surface of the brush armature illustrated in Figure 69 on which the carbon "brushes" make their contact. The commutator face and its slots can be easily seen on locomotives having a transverse-mounted motor (See Figure 6). To polish the commutator face turn the locomotive on its side and connect one wire from transformer wire to any part of the metal body of the locomotive. The motor will then run. While the motor is running press a small piece of very fine sand paper or an emery stick against the moving commutator. Then clean out the commutator slots with a pointed tool such as a toothpick or pin.

In locomotives using a longitudinal motor the commutator slot can be reached through a hole in the center of the brush plate. However, in most locomotives of this type the locomotive body must be taken off to reach the motor for cleaning and lubrication.

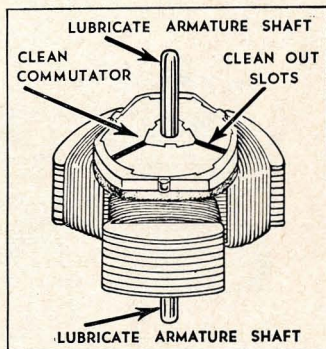


Figure 69—Armature from a Transverse Motor

REPLACING HEADLIGHT LAMPS

If the bulb in the locomotive headlights or in an illuminated accessory does not light, first check to see that the bulb is tight in its socket. If the lamp is burned out you can easily replace it yourself by obtaining a spare from your dealer. The chart on the inside of the back cover lists replacement lamps for all modern Lionel equipment.

To reach the lamp on modern Lionel locomotive follow the directions below:

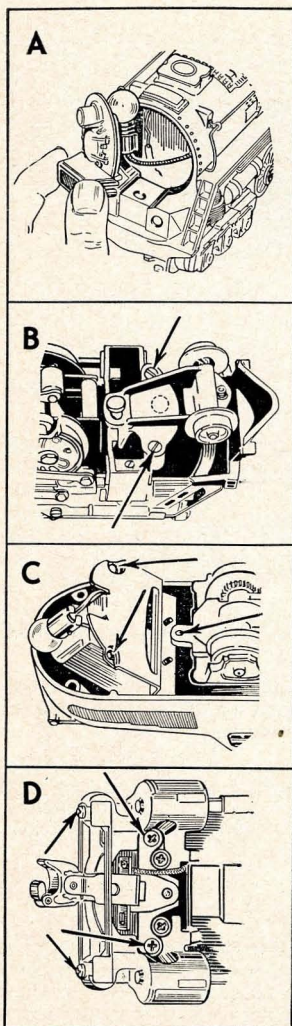


Figure 70—Replacing Lamps

622	Remove cab by inserting a screwdriver in the slots on the bottom and turning as indicated.
671	Pull out boiler front (Fig. 70A).
675	Pull out boiler front (Fig. 70A).
726	Open hinged boiler front.
1654	Unscrew front truck bracket (Figure 70B).
1656	Unscrew front step and coupler bracket (Figure 70D).
2020	Pull out boiler front (Fig. 70A).
2025	Pull out boiler front (Fig. 70A).
2332	Unscrew end truck bracket by removing two screws and pivot screw (Figure 70D).
2333	Take off body by removing three screws (Figure 71).

The screws to be removed in each case are shown by arrows. Special star-shaped screws used in some locomotives can be removed with a small screwdriver or a special star-shaped screwdriver which can be obtained in automobile supply and hardware stores.

Figure 71 also shows the location of the flashlight cell which is used to operate the horn in the 2333 diesel locomotive. When the locomotive is stored away the cell should be removed.

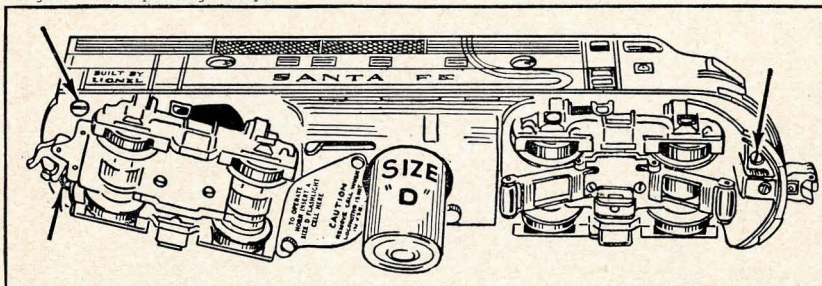


Figure 71—Bottom View of No. 2333 Diesel Locomotive

MOTOR TROUBLE SHOOTING

If your train refuses to run, first make sure that the transformer is plugged in and that you are getting current from the transformer output terminals. Then see that all connections on transformers and track are correct and firmly fastened. See that there are three steel pins inserted at the end of each section of track.

If train still does not run, disconnect the two transformer wires from track. Prop up the locomotive so that the wheels are free to turn and touch one of these wires to any unpainted part of the motor frame. With the other wire touch the contact shoe which collects the current from the center rail of the track. If motor still does not operate, it may be that the reversing unit is in neutral position. If the E-Unit is in neutral position, the locomotive will not run, although the locomotive headlights will be on. Try the above procedure with different adjustments of the reversing unit lever.

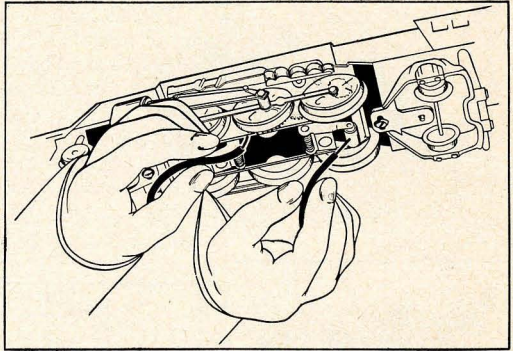


Figure 72—How to Test Locomotive Motor.
Locomotive Should Be Erect

If the wheels move very slowly, cleaning and lubricating the motor may be all that is necessary to restore original power.

If motor starts and stops, or if wheels do not revolve, look for loose connections. See if the carbon brushes make good contact with commutator. Clean the commutator as described in a previous section.

If the wheels revolve freely there is nothing wrong with the locomotive motor. The trouble may be that the contact shoe rollers do not have enough tension to make proper contact with the center rail. If contact rollers appear to be badly worn, have them replaced at the nearest Service Station.

FINDING SHORT CIRCUITS

A short circuit is a direct connection between the two output terminals of the transformer or between the center rail and one of the outside rails. It causes an excessive current to be drawn from the transformer so that the transformer circuit breaker keeps on opening and closing. The short circuit may be caused by a piece of metal or wire accidentally joining the center and the outside track rails, or by broken insulation between the center rail and the metal cross-ties.

If you have trouble in discovering the cause of a short circuit proceed as follows. Remove the train and all other equipment from the track and make sure that a piece of metal or Christmas tree tinsel is not touching the rails. See that all sections of track fit tightly. Then connect one wire from transformer to an outside rail and brush the end of the other transformer wire across the center rail. If the track is perfectly insulated no sparking will occur at the place where the wire touches the rail, but if it is short-circuited, sparks will appear.

To locate the short-circuited section, disconnect one section of track at a time and apply the wires to the remaining sections as explained above. When the defective section is removed, the sparking will stop.

LIONEL SERVICE STATIONS

AUGUST 1

JULY 31

1949 - 1950

factory
seal of
approval



LIONEL Products are guaranteed against defects in material and workmanship to the extent that if any such defective article is returned to the Lionel Service Department or to any Lionel Authorized Service Station within a year of the date of purchase it will be repaired or replaced.

If any of your equipment needs servicing you may send it either to the Factory Service Department or to any Lionel Approved Service Station.

Although the Lionel Approved Service Stations listed in the following pages are independently

owned and operated, each has been carefully checked by The Lionel Corporation for reliability. These Service Men are experts and most of them have been adjusting and repairing Lionel equipment for many years. Lionel Authorized Service Station approval is not permanent but has to be renewed from year to year to assure continuing high standard of service.

In addition, The Lionel Corporation maintains two large Service Stations of its own. One is at 15 East 26th Street, New York 10, New York, and the other is at 1460 Chestnut Avenue, Hillside 5, New Jersey.

The Lionel Corporation assumes no responsibility, financial or otherwise, for material left or work done by privately-owned Lionel Approved Service Stations. Any complaints brought to our attention will be quickly investigated.

THE LIONEL CORPORATION

Approved Service Station Division

1460 Chestnut Ave. HILLSIDE 5, N.J.



LIONEL APPROVED SERVICE STATIONS

ALABAMA

BIRMINGHAM Stewart's Sport Shop, 3 No. 19th Street
MOBILE Roy's Hobbyland, Inc., 67 So. Jackson Street
MONTGOMERY Pake-Stephenson, Inc., 14 Commerce Street

ARIZONA

PHOENIX Lionel Train Hospital, 2915 N. 16th Street

ARKANSAS

LITTLE ROCK 555 Incorporated, Third and Broadway
Parsel's, 316 West Capitol Avenue

CALIFORNIA

ALHAMBRA W. L. Moore, 308 So. Second Street
BAKERSFIELD Snider's, 1011 Baker Street
HOLLYWOOD Hollywood Hobby & Electric Shop, 1522 Cahuenga Blvd.
INGLEWOOD The Hobby House, 610 East Manchester Blvd.
KINGSBURG Olson Bros., 1530 Marion Street
LONG BEACH Ray's Hobby Model Supply, 1222 American Avenue
LOS ANGELES California Electric Service Stations, 832 So. Alvarado Street
Colonel Bob's, 3707½-3709 West Pico Blvd.
J. R. Metz, 1753 West 21st Street
Train Repairs, 5406½ Lemon Grove
Troxel Brothers Models, 202 So. Western Avenue
OAKLAND Jack Collier's "Toys for Men", 3669 Grand Avenue
Lee's Train Service, 3980 Piedmont Avenue—Phone: Piedmont 5-7877
PALO ALTO Palo Alto Sport Shop, 526 Waverley Street
PASADENA Garstang's Trains & Toys, 87 E. Colorado Street
SACRAMENTO H. Cameron, Jr., 609 Jay Street
H. K. Vance, Train Repairs, 2784 Portola Way
SAN DIEGO Frank "The Trainman", 4310 Park Boulevard
SAN FRANCISCO California Electric Service, Inc., 168 First Street
Jack Collier's "Toys for Men", 693 14th Street
SAN MATEO Jack Smith Toys & Bicycles, 1927 El Camino Real—Phone: Fireside 5-1215

COLORADO

COLORADO SPRINGS Earl Udick Service, 115 No. Nevada Avenue
DENVER Fisher Hardware Company, 2322 E. Colfax Avenue

CONNECTICUT

BRIDGEPORT R. E. Blinn & Son, Inc., 64 Cannon Street
Senior's, Inc., 1200 Broad Street
HARTFORD Marholins, Inc., 1177 Main Street
MIDDLETOWN Amato's Hobby Center, 600 Main Street
Charles E. Bacon, 47 Sumner Street
NEW HAVEN Hull's Hobbies, 1203 Chapel Street—Phone: 8-4319
Parmele & Sturges, Inc., 51 Crown Street
STAMFORD Max K. Trell, 497 Main Street

DELAWARE

WILMINGTON Knowles Model & Music Shop, 407 Shipley Street
Schweizer Repair Shops, 525 W. Front Street

DISTRICT OF COLUMBIA

WASHINGTON Corr's Nation's Hobby Supply, 812 Ninth Street, N.W.
Carl W. Dauber & Sons, 2320-24 18th Street, N.W.
Spring Valley Electric Shop, 4805 Massachusetts Avenue
Superior Lock & Electric Co., 1410 "L" Street, N.W.

LIONEL APPROVED SERVICE STATIONS

FLORIDA

FORT LAUDERDALE Hobby House, 33 S.E. 2nd Street
JACKSONVILLE Harold Ashley Company, 1636 Hendricks Avenue
 Frank Whipple's Model Sales & Service, 2817 Main St.—Phone: 3-0414
MIAMI The Hobby Center, Inc., 3621-23 S.W. Eighth Street
 Geo. E. Wintz Toys, 150 N.E. 1st Street
 Wintz Toy Shops, 7933 N.E. 2nd Avenue (Little River)
MIAMI BEACH Wintz Toy Shops, 2229 Collins Avenue
ORLANDO Toyland, Inc., 705 North Orange Avenue
PENSACOLA Roy's Hobbyland, Inc., 11 W. Intendencia Street
ST. PETERSBURG W. R. Lancaster & Son, 827 Central Avenue
TAMPA Columbia Music & Appliance Co., 1427 E. Broadway
 Tampa Radio Sales, 809 Florida Avenue

GEORGIA

ATLANTA Buckhead Hobby Shop, 3098 Peachtree Road, N.E.
 Walco Sporting Goods Company, 41 Pryor Street, N.E.
COLUMBUS Bentley's Sport Shop, 1303-05 Broadway
DECATUR Clark Equipment Company, 111 Sycamore Street
MACON Macon Hobby Shop, 400 Second Street
SAVANNAH The Hobby Shop, 254 Bull Street

ILLINOIS

AURORA May Electric Appliance, 61 Fox Street
BELLEVILLE Home Service Appliance Co., 104 W. Main Street
BERWYN Goldeck Model Airplanes & Hobby Shop, 2615 So. Ridgeland Avenue
BLOOMINGTON Harry's Hobby House, 102 E. Market Street
CHAMPAIGN Paul Lauterborn's Appliance Supply Shop, 117 No. Walnut Street
CHICAGO A-Abart Electric Co., 506 N. Milwaukee Ave.—Phone: Taylor 9-5555
 Ahern's Cycle Shop, 4540 W. 63rd Street
 Arnold Bonse's Hobby Shop, 10210 So. Emerald Ave.—Phone: Ced. 3-4934
 Ben's Hobby Shop, 72 W. Washington Street—Phone: Financial 6-0827
 C. & I. Hobby Center, 3249 W. 63rd Street—Phone: Grovehill 6-5117
 E. & G. Model & Hobby Shop, 4121 W. 26th St.—Phone: Crawford 4268
 Gross Radio & Electric Shop, 6767 Stony Island Avenue
 Kenmac Radio Center, Inc., 4357 Sheridan Rd.—Tel.: Eastgate 7-8533-4-5
 Leader Model Supply Company, 6539 S. Ashland Avenue
 Mack Brothers, 2041-7 W. Chicago Avenue—Phone: Taylor 9-3400
 O. R. Martin Company, 916 Belmont Avenue
 Northwest Model Shop, 5037 Irving Park Blvd.
 Steve's Hobby Center, 103 E. 111th Street
 West Towns Hobby Shop, 5808 W. Chicago Avenue
CHICAGO HEIGHTS Illiana Train Shop, 20335 Torrence Avenue
CONGRESS PARK Raby's Sporting Goods & Bicycles, 4170 Raymond Avenue
DANVILLE Electric Trains Sales & Service, 109 S. Gilbert Street
DECATUR Hobby House, Inc., 123 E. William Street
EVANSTON Noren Cycle & Hobby Shop, 2805 Central Street
HARVEY Macander Radio & Electric, 15710 S. Halsted Street
LA GRANGE La Grange Hobby Center, 124 W. Burlington Avenue
MOLINE Ralph Crespín, 1832 4th Street
OAK PARK Realistic Models, 725 South Boulevard
PEORIA J. V. Harrison Electric Co., 416 Sterling Avenue
 Hobbymodels, 327 So. Washington Street
ROCKFORD Hedrick Electric Company, 201 Seventh Street
 Swanson Electric Appliance Repair, 226 Ogden Avenue
URBANA Urbana Cycle & Sport Shop, 116 S. Race Street
WAUKEGAN Hyde Electric Shop, 1409 Washington Street
WINNETKA Fix-It Shop of Winnetka, 552 Green Bay Road

INDIANA

EVANSVILLE Automotive Electric Service, Inc., 300 Ingle Street
FORT WAYNE Ralph H. Calvert, Union Central Lines, 1132 Wabash Avenue
 Phone: Eastbrook 5204
 Krull's Tire & Sporting Goods Store, 414 E. Washington

LIONEL APPROVED SERVICE STATIONS

INDIANA (Continued)

GARY
HAMMOND
INDIANAPOLIS

Brams Toy & Hobby Shop, 4484 Broadway
K-D Sport Shop, 5529 Hohman Avenue
Broad Ripple Hobby Supply, 929 Westfield Boulevard
Les' Repair Service, 1724 Central Avenue (rear)
Bob Steele's Hobby Center, 3324 E. 10th St.—Phone: Atlantic 6411
Lafayette Model Supply Shop, 805-809 S. 26th Street
C. B. Kirk Co., 117 E. Main Street
Jim's Repair, 822 So. 11th Street
Grose's Bike Shop, 226-228 W. Washington
Hobby King, 118 S. Main Street

LAFAYETTE
MUNCIE
RICHMOND
SOUTH BEND

IOWA

CLINTON
DES MOINES
DUBUQUE
SIOUX CITY

Handy Repair Service & Hobby, 1913 No. 2nd Street
Iowa Service Company, 12th and Mulberry
Pohl's Radio & Electric Train Repair Service, 1810 Lincoln Avenue
K & K Radio Service & Hobby House, 1209 Pierce Street

KANSAS

BELOIT
LAWRENCE
TOPEKA
WINFIELD
WICHITA

Gus' Hobby Shop (& or) Electric Appliance Co., 110 E. Main
Scott Temperature Equipment Co., 729 New Hampshire St.—Phone: 326
Martin's Hobby Shop, 2401 Sardou Avenue
Enterprise Sales Co., 812 Main Street
Train Service Co., 5421 E. Kellogg Avenue

KENTUCKY

LOUISVILLE
ST. MATTHEWS

Fischer's Hobby Service, 618 S. Fourth Street
Kentucky Model Shop, 3812 Frankfort Ave. at Lexington

LOUISIANA

BATON ROUGE
BOSSIER CITY
NEW ORLEANS
SHREVEPORT

Pelican Model Shop, 2815 Main Street
Gross Williams Appliance Co., 308 E. Texas Street
St. Claude Hardware & Paint Store, 4208-10 St. Claude Avenue
C. G. Staubitz Co., 4118 So. Carrollton Avenue
C. G. Staubitz Co., 4334 St. Charles Avenue
Standard Furniture & Hardware Co., 135 E. 70th Street
Stovall Tire & Supply Co., 3001-7 Highland Avenue

MAINE

BANGOR
LEWISTON
PORTLAND

Cal's Electrical Shop, 22 Hammond Street
The Merrill Laboratory, 204 Lisbon Street
Parker L. Starrett, 165 High Street

MARYLAND

BALTIMORE

Bacharach-Rasin Co., 14 No. Howard Street
The Electric Motor Repair Co., 340 Fallsview
French's Inc., 304 West Baltimore Street
Govans Hardware, 5007 York Road
W. S. Lloyd & Son, 2117 N. Charles St.
Pospisil's Service Station, 8030 Eastern Avenue
Louis J. Smith, 510-12-14 So. Conkling Street
The Spot Hobby Shop, 304 Park Avenue
The Hobby Shop, 108-110 Frederick Street
Bartgis & Zimmerman, Inc., 30-36 East Patrick Street
Hawkins Electric Co., 5604 Rhode Island Avenue
Hitt's Electrical Service, 211 East Montgomery Avenue
Howard's Electrical Repair & Hobby Shop, 617 Truitt Street

CUMBERLAND
FREDERICK
HYATTSVILLE
ROCKVILLE
SALISBURY

LIONEL APPROVED SERVICE STATIONS

MASSACHUSETTS

BOSTON	Boston Model Railroad Co., 665 Atlantic Avenue Eric Fuchs Model Railroads, 26 Tremont Street
BROCKTON	Brockton Hobby Shop, 67 East Elm Street
BROOKLINE	Beacon Train & Toy Shop, 1378B Beacon Street
E. DEDHAM	Seale's Service Shop, 39 High Street
FALL RIVER	Ashton's Sporting Goods, 35 Borden Street
LOWELL	Henry Poirier, Inc., 636-646 Merrimack Street
LYNN	John C. Coggin, 32 Beacon Hill Avenue Fuller Electric Company, 73 Summer Street
NORTH DARTMOUTH	Trilor's, State and Reed Roads
SPRINGFIELD	O. F. Springer Jr. & Co., 703A State Street
WORCESTER	Henry's Hobby House, 37 Trumbull Street Sandberg Supply Company, 37-43 Mechanic Street

MICHIGAN

DETROIT	Baker & Baker, 11710-12 Chalmers Ave.—Phone: Lakeview 6-3800-1 Downtown Repair Service, 122 W. Elizabeth—Phone: Wo. 16932 Hiram Marks Electric Company, 427 Randolph Street—Phone: CA-5553 The Train Clinic, 13950 Hubbell Avenue—Phone: Vermont 7-6430 Vaughan's Radio & Train Shop, 15434 Harper Ave—Phone: La. 7-0771
FLINT	Evinrude-Elto Flint Sales, 2101 So. Saginaw Street
GRAND RAPIDS	C. A. Meyers & Company, 45 Monroe Avenue, N.W.
GROSSE POINT JACKSON	Judy's Gift Shop, 17151 Kercheval Avenue Model Railroad Specialty Company, 1915 E. Michigan Avenue
KALAMAZOO	Hine & Endsley Toy Company, 1324 Poplar Place Howard's Radio Shop, 925 So. Burdick Street
LANSING	The Hobby Hub, 12-A Michigan Theatre Arcade
MUSKEGON	C. Karel & Sons, 936-38 Pine Street
PONTIAC	Tasker's, 63 West Huron
PORT HURON	Hank Schneider, 708 Huron Avenue
ROYAL OAK	Dunn's Hobby Arcade, 738 S. Washington Cor. Linden

MINNESOTA

DULUTH	Martin Carr, "Train Doctor", 901 E. Superior St.—Phone: Hem 798
MANKATO	Joseph Manderfeld Company, 509 So. Front Street
MINNEAPOLIS	Ken Dean's Train Repair Shop, 611 Second St., N.E.—Phone: GE 6825 Warner Hardware Company, 13 So. Sixth Street
ST. PAUL	Cal's Twin City Hobby Shop, 593 N. Snelling—Phone: MI 8998 Hylands Hobbycraft Shop, 914 Grand Avenue Uptown Music & Hobby Shoppe, 357 Robert Street—Phone: CE 6079
WINONA	Fayette O. Ehle, Radio-Bicycle Service, 162 E. 3rd Street

MISSISSIPPI

JACKSON	Nelson's Incorporated, 125 So. Lamar Street
MERIDIAN	Griffin Radio & Supply Company, 4416 8th Street, P.O. Box 1404

MISSOURI

CLAYTON	The Playroom, 7730 Forsythe Blvd.
FERGUSON	A. G. Freihoff, 26 Compton Avenue—Phone: Atwater 2436W
KANSAS CITY	Baird-Whitmer, 431 Alameda Road Siebers Brothers Models, 404 Westport Road Smith Appliance Company, 5100 Independence Avenue Sterling Tire & Supply Co., 600 E. 31st Street
SPRINGFIELD	Ozark Mountain Railroad, 2075 Hoffman Avenue
ST. JOSEPH	Economy Oil Company, 8th and Monterey Street
ST. LOUIS	Bell Radio & Appliance Company, 6190 Delmar Brandt Electric Company, 904 Pine Street Johnston Electric Train Company, 3118 Chippewa Street

LIONEL APPROVED SERVICE STATIONS

MONTANA

BUTTE

Philips Repair Shop, 2226 Silver Bow Street

NEBRASKA

LINCOLN OMAHA

Steve's Railroad Yard, 1841 Garfield
Cappy's Sporting Goods, 215 No. 16th Street
Benjamin W. Hicks, 2758 Sharon Drive—Phone: Kenwood 1244

NEVADA

RENO

Builders and Farmers Hardware Co., 1274 So. Virginia Street

NEW HAMPSHIRE

CONCORD MANCHESTER

French's Radio Shop, 10 No. State Street
Coughlin's, 782 Elm Street

NEW JERSEY

ASBURY PARK

Train Headquarters, 420 Main Street—Phones: Asbury Park 2-1140
Deal 7-8525-W

ATLANTIC CITY BAYONNE CAMDEN

M. R. Hall & Son, 3939 Ventnor Avenue—Phone: 2-4166
Dobb's Service Station, 720 Broadway—Phone: Ba-4310-11

DUNELLEN EAST ORANGE ELIZABETH FAR HILLS GARFIELD HOBOKEN IRVINGTON

Denver's Hobby Shop, 312 Federal Street
Federal Hobby Shop, 28th and Federal Streets
Model Railroad Shop, Corner Vail Avenue and N. M. Road
Briteway Electric Service, 959 So. Orange Ave.—Phone: OR 5-9538
Hobby Depot, Inc., 274 No. Broad Street
Orville Richard Seals, Lionel Trains, Spring Street
Treasure House—Lionel Train Center, 27 Passaic St.—Phone: PR 7-4331
Ben Cowan & Bro. Elec. Shop, 201 Washington Street
Kraft Hardware, 746 Springfield Avenue
Madison Cycle Company, 1288 Springfield Avenue
Tony Statile's House Bazaar, 309 Central Avenue—Phone: JO 3-9392
Uneeda Appliance Company, 2973 Boulevard—Phone: JO 5-1660

JERSEY CITY

Steve Varga's Hobby Shop, 57 Easton Avenue
Neil Hardware, 449 E. 18th Street
Spivak Bros., 42 Main Street—Phone: Sherwood 2-1516

NEW BRUNSWICK PATERSON

Fishkin Bros., Inc., 157 Smith Street
Keith Willever & Sons, 314 So. Main Street
F.I.A.T. Inc., 19 West Ridgewood Avenue—Phone: RI 6-3030

PERTH AMBOY PHILLIPSBURG RIDGEWOOD TRENTON

Ardmore Electric Shop, 916 Hamilton Avenue
Terry Town Toys, 159 E. Front Street
Central Jersey Models, Cor. North and Lenox Avenues

WESTFIELD

NEW YORK STATE

ALBANY AMSTERDAM BATAVIA BINGHAMTON

Charles Klarsfeld, 67 Hudson Avenue
The Radio Workshop, 285 W. Main Street
Batavia Brake & Duco Service, 8 Exchange Street
Kern's Hobbies, 2 Court Street
Speed Queen Appliance Co., 60 Exchange Street

BUFFALO

Marty Jones, 240 Forest Avenue
Chester I. Spoonley, 37 Choate Avenue
Train-Masters, Inc., 701 Kensington Avenue
E. S. Waggoner, 1380 Jefferson Avenue

ELMIRA ITHACA JAMESTOWN MT. VERNON NEW ROCHELLE POUGHKEEPSIE

Bunis Books, Toys & Hobbies, 142 E. Water Street
Powers' Instrument Shop, Buttermilk Falls, R.F.D. No. 5—Phone: 31525
Model Railroad Laboratories, Box 72
Telly Electric Supply, 116 Gramatan Avenue—Phone: MO 8-0750
Jack & Jill Wonderland, 322 Webster Avenue—Phone: NR 2-5898
Lasus & Sons, 255 Huguenot Street
Len Melhado's, 511 Main Street

LIONEL APPROVED SERVICE STATIONS

NEW YORK STATE (Continued)

ROCHESTER	E. A. Gardner, "The Train Doctor", 2261 Dewey Ave.—Glenwood 2847 Kanzler Electric Co., 180 Normandy Avenue Lake Ave. Hobby & Craft Shop, Inc., 583 Lake Ave. Cor. Ravine Ave.
SCHENECTADY	Henry's Cycle Shop, 888-90 Albany Street
SYRACUSE	Ed Guth Hobbies, 132 E. Genesee Street Jack's Hardware, 1906 South Avenue—Phone: 5-0820 Sperry Craft Shoppe, 107-109 W. Taylor Street
TROY	French's Model Shop, 20 State Street
UTICA	Darjany's, 602 Bleecker Street
WHITE PLAINS	Westchester Train & Toy Co., Inc., 4A So. Lexington Avenue

LONG ISLAND

AMITYVILLE	Amityville Hardware, 212 Broadway
BELLEROSE	Bellerose Hobby Center, 247-03 Jamaica Ave.—Phone: Fieldstone 7-2513
CEDARHURST	Stanlen, Inc., 566 Central Avenue
FLUSHING	Pleasure Mart, Inc., 161-27 Crocheron Avenue
GREAT NECK	Village Toy Mart, 697 Middle Neck Road
HEMPSTEAD	H. Blumberg & Sons, Inc., 278 Front Street
HUNTINGTON	Huntington Auto & Electric Parts, 215 Main Street
JAMAICA	S. Bellitte & Sons, 169-20 Jamaica Ave.—Phone: REpublic 9-3795
RIDGEWOOD	Nagengast Hardware, 68-02 Fresh Pond Road
WOODHAVEN	Manor Sporting Goods Co., 93-28½ Jamaica Avenue
WOODSIDE	Cye Hobbycraft, 39-84 61st Street

NEW YORK CITY

MANHATTAN	Crystal Electric Co., Inc., 1461 Third Avenue Hobby-Land, 25 Park Row Madison Hardware Company, 105 East 23rd St.—Phone: SPring 7-1111 Model Craft Hobbies Retail Inc., 314 Fifth Avenue Model Railroad Equipment Corp., 23 West 45th Street Neidoff's Radio & Electrical Appliances, 195 Columbus Avenue
BRONX	Electro-Craft Appliances, 3 West Tremont Avenue Fazekas Bros., Inc., 1051 West Farms Road Honig's Cycle Service, 2725 White Plains Avenue Van Courtlandt Hobby Shop, 5973 Broadway
BROOKLYN	Alandes Electric Co., 1724 Nostrand Avenue Embassy Carriage Shop, 3181-85 Fulton Street Fix All Appliance Shop, 704 Kings Highway—Phone: ES 5-1894 Fred Frerichs Elec. Co., Inc., 6316 Fifth Avenue Herman Electric, 1324 Flatbush Avenue Hobby Train Mart, Inc., 37 Bond Street
RICHMOND	Sternier & LeBlanc, Port Richmond, S. I., 245 Jewett Ave.

NORTH CAROLINA

CHARLOTTE	Charlotte Hobby Center, 131 W. 4th Street Model Railroad Supply Shop, 2941 Chelsea Drive
DURHAM	B. C. Woodall Company, 136-38 E. Chapel Hill Street
GREENSBORO	Strong Tire Service, Inc., 401 N. Elm Street
HIGH POINT	Dick Culler, Inc., 244 N. Wrenn Street
RALEIGH	Johnson-Lambe Co., 118 S. Salisbury Street
WINSTON-SALEM	Bocock-Stroud Co., Fourth at Spruce St.

OHIO

AKRON	Cahoon's, 38 High Street
BARBERTON	Barberton Hardware Co., 579 Tuscarawas Avenue
BUCYRUS	Rogers Sporting Goods, 221 No. Sandusky Ave.—Phone: 5452
CANTON	Dealer's Appliance Sales & Service, 4214 54th St., N.W.—Phone: 9-2100 The Eclipse Electric Co., 209 Second Street, N.E.
CINCINNATI	Don's Hobby Service, 824 Main Street Foltzer's Electric City, 214 East 4th Street Ridge Hobby Shop, 6008-10 Montgomery Road—Phone: RE-3085 X-L Model Shop, 2503 Fairview Avenue—Phone: CH-9310

LIONEL APPROVED SERVICE STATIONS

OHIO (Continued)

CLEVELAND	Leonard M. Blum's Hobby House, Inc., 610 Huron Road Cleveland Cycle & Model Co., 14679-81 Euclid Avenue Cleveland Model & Supply Co., Lorain Avenue at W. 45th Street Reddig's Electric Train Service, 3553 Independence Rd.—Diamond 1447 Lester M. Riedel, 350 E. 248th Street Salzer's Electric, Inc., 1760 E. 12th Street
COLUMBUS	Hobby Harbor, 121 E. Gay Street Hoffman Electric Train Service, Rear 485 Wilson Ave.—Tel.: EV 8-3581
DAYTON	The Riverdale Model Railroad Center, 3205 N. Main St.—Taylor 7039 Dayton Model Railways, 1318 Wayne Avenue
GARFIELD HEIGHTS	Garfield Heights Radio & Elec., 4471 E. 131st Street
IRONTON	Paul's Hobby Shop, 1012½ So. 4th Street
LIMA	Hobby House, 110 S. Elizabeth The Murphy Electric Co., 304 So. Main Street
MANSFIELD	Penn Auto & Sporting Goods, 22-24 S. Main Street
MASSILLON	The Happpoldt Electric Co., 23 First Street, S.W.
NEWARK	Anderson's Service Store, 11 N. 4th Street
SPRINGFIELD	Petry & Sons, R. R. 1
TOLEDO	Hines Hobby House, 621 Madison Avenue Lueft Hardware Inc., Galena at Ontario Street Tanber's, 1241 Dorr Street
YOUNGSTOWN	Model Hobby Shop, 2720 Cain Street Carl W. Weimer, 520 W. Evergreen Avenue

OKLAHOMA

ENID	Enid News & Stationery, 213 N. Independence
OKLAHOMA CITY	Nichols Hills Radio & Hobby Shop, 2340 Dorchester Drive Woodmansee Abbott Music Co., 407 W. Main Street
TULSA	Brewster Electric & Hobby Shop, Peoria at Tenth Oil Capitol Hobbyland, 702 S. Boston Tulsa Hobby Center, 305 E. Fourth Street

OREGON

PORTLAND	R. Bowles-E. C. Flegel, 3804 N. Melrose Drive
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PENNSYLVANIA

ALLENTOWN	Gene Bloch's Paint Store, 22 No. 8th Street
ALTOONA	Central Electric Co., 1124 Eleventh Avenue
ARDMORE	D. F. Donohoe, 69 E. Lancaster Avenue—Phone: Ardmore 3316
BETHLEHEM	Austin Electric Supply Co., 218 West Third Street
CHAMBERSBURGH	Enos H. Horst Electric Store, 124 Lincoln Way West
CHARLEROI	Bob's Hobby Shop, 616 Fallowfield Avenue
CHESTER	Chester Light Supply Co., 801 Edgmont Avenue
COATESVILLE	Marcus F. Kline & Son, 27 North Second Avenue
DOYLESTOWN	Hampton Radio and Appliances, 52 E. State Street
EASTON	Hobby Hangout, 509 Northampton Street Carl H. Messinger, 1529 Spring Garden Street
ERIE	Erie Hobby Company, 406 State Street
GLENSIDE	Keswick Cycle Company, 344 North Easton Road
HANOVER	E. J. J. Gobrecht, 120 E. Chestnut Street
HARRISBURG	Joe The Motorists' Friend, Inc., 3101 N. 7th Street Russ Hobby Service, 138 S. Seventeenth Street
HAZLETON	Jere Woodring & Company, 200 W. Broad Street
JOHNSTOWN	Johnston's Appliance Center, 135 Clinton Street Reese & Bernard Electric, 132 Park Place
LANCASTER	Felsinger's Hobby Shop, R. D. No. 2
LEBANON	Keystone Appliance Company, 503 Cumberland Street
LEWISTOWN	Grabbe's Electrical Store, 140 Valley Street
LLANERCH	"Service of Merritt", 126 West Chester Pike—Phone: Sunset 9089
McKEES ROCKS	A. K. Electric, 417 Chartiers Avenue
McKEESPORT	The Helm Electric Co., 927 Jenny Lind Street Johnston Appliance Store, 1013 Fifth Avenue

LIONEL APPROVED SERVICE STATIONS

PENNSYLVANIA (Continued)

NEW CASTLE PENNSBURG PHILADELPHIA

Kirk, Hutton & Co., 24 E. Washington Street
Hevener & Shelly, 400 Main Street
The Arnold Company, 1427 Vine Street
Baus & Sucro, 7205 Rising Sun Avenue
Wm. H. Becker, 46 North 11th Street
D. & S. Hardware & Electronic Supply, 5936-38 Torresdale Avenue
D. & S. Hardware & Electronic Supply, 6624 Castor Avenue
The Electronic & Hobbycraft Stores, Inc., 324 W. Chelton Avenue
The Electronic & Hobbycraft Stores, Inc., Boulevard Shopping Center
Hubbell Electric Co., 223 So. 11th Street
"Les" Myers Inc., 21 South Sixteenth Street—Phone: RI 6-8047
Olney Miniature Train Parts & Repairs, 142 W. Linton Street
Schempp Bros. Hardware Co., 2526 Kensington Avenue
Simkins Electric Company, 420 W. Susquehanna Avenue
Nicholas Smith, 60 N. 11th Street
Tioga Electric Shop, S.E. Cor. 17th Street and Erie Avenue
Wolkin's, 48 South 60th Street

PITTSBURG

Brentwood Elec. Sales & Service, 2819 Brownsville Road
Conklin Radio & Elec. Appl. Co., 1405 Lincoln Ave.—Tel.: Hililand 1652
Ferry Electric Service Co., 127 Fourth Avenue
Larry's Hobby Shop, 1826½ Brownsville Road
Quick Service Electric Co., Jenkins Arcade, 509 Liberty Avenue
Phone: Atlantic 1-0968

READING SCRANTON

Lapp Bros. Electrical Stores, 146 Washington Street
Fixit Shop, 610 Linden Street

SHARON UPPER DARBY WAYNE WEST PITTSBURG WILKES-BARRE

Scranton Hobby Center, 315 Adams Avenue
Mihlbaugh's Service Center, 32 Silver Street
Herman's Repair Shop, 6833-35-37 Ludlow Street
Vecere's Hobby Shop, 101-103 E. Lancaster Avenue
Embleton's Electric Service, 422 Wyoming Avenue
Harry W. Hick, 27 Regent Street
Robbins & Uhl, 28 N. Main Street

WILKINSBURG WILLIAMSPORT

Community Radio Electric Service, 745 Penn Ave.—Phone: CH 1-6464
Fink's Sporting Goods, 17 West Third Street
Prior & Sallada Company, Inc., 230 Pine Street
The Model Craft Shop, 113 South George Street

YORK

RHODE ISLAND

PAWTUCKET

Farrell & Goff, 166 Pawtucket Avenue
The Round House, 2 River Street

PROVIDENCE

G & B Supply Company, 435 So. Main Street
The Hobby Shop, 73 Empire Street—Phone: Jackson 1-1712
The Train Shop, 112 Broad Street—Phone: Jackson 1-9099

SOUTH CAROLINA

CHARLESTON

The Carolina Hobby Shop, 221 King Street
Electric Supply Co., 161 Meeting Street

COLUMBIA

Westons, Inc., 3308 Millwood Avenue

FLORENCE

Florence Models & Toys, 202 S. Graham Street—Phone: 1060J

GREENVILLE

DeLany's Sporting Goods, 24 College Street

SPARTANBURG

Aaron C. Read, 570 Reidsville Road

TENNESSEE

BRISTOL CHATTANOOGA KNOXVILLE MEMPHIS

Larry's Railroad Toyland, 17 6th Street
Harden Repair Shop, 2806 8th Avenue
The Hobby Shop, 511 W. Clinch Avenue
Electric Train Hobby Shop, 841 Barbara Drive
Hobby Center, Inc., 368 N. Cleveland

NASHVILLE

Austin Electric Shop, 3430 West End Avenue
Burk & Company, 416-22 Church Street

LIONEL APPROVED SERVICE STATIONS

TEXAS

ABILENE	D & W Tire Company, 102 Elm Street
AUSTIN	George Stautz, 116 W. 5th Street
BEAUMONT	Stuart's, Inc., 301 Orleans Street
CORPUS CHRISTI	C & C Toy & Model Shop, 929 South Staples
DALLAS	Hall's Hobby House, 4823 Bryan at Fitzhugh
	Handicraft Supply, 411 N. Akard
	Hobby Nobby Stores, 1625 Pacific Avenue—Phone: Riverside 3565
EL PASO	Lowenberg Hobby Shop, 2511 E. Yandell Blvd.—Phone: 2-5397
FORT WORTH	Modelcraft, 1304 W. Terrell
HOUSTON	G & G Model Shop, 1523 Isabella Street
PARIS	Commercial Electric & Supply Co., 27 First Street, N.W.
SAN ANTONIO	Dibble's, 313-315 S. Alamo St. at Goliad
	The Fixit Shop, 801 Fredericksburg Road
TYLER	Flinn-Holley, Inc., North Broadway at Locust

UTAH

OGDEN	P. G. Boam Company, Rear 2326 Washington Blvd., P.O. Box 1401
SALT LAKE CITY	Electronic Service & Supply Co., 115 East Broadway
	Zion's Cooperative Mercantile Inst., Dept. 110, 15-39 So. Main Street

VIRGINIA

ALEXANDRIA	A. L. Ladd, 1013 King Street
BRISTOL	Larry's Railroad Toyland, 17 6th Street
CHARLOTTESVILLE	Piedmont Refrigeration Co., 1509 W. Main Street
LYNCHBURG	Rivermont Radio, 1216 Rivermont Avenue
NEWPORT NEWS	The China Palace & Gift Shop, 3307-09 Washington Avenue
	The Hobby Center, 3704 Washington Avenue
NORFOLK	G. Engel & Son, 721 Granby Street
	Zephyr Miniatures, 16 Monticello Arcade
PORTSMOUTH	Hobby Lobby, Box 186
RICHMOND	Center Hardware, Inc., 328 No. 6th Street
	Jones & Gooding, 3158 W. Cary Street
	Zephyr Miniatures, 116 Broad and Grace Arcade—Phone: 29381
ROANOKE	Dowdy Electric Co., 32 Church Avenue, S.W.
	Jennings-Shepherd Co., 411 First St., S.W.
STAUNTON	Ast Hardware Co., Inc., 102 W. Beverley Street

WASHINGTON

BREMERTON	Modern Home Store, 2515 Burwell
SEATTLE	Model Railroad Repair Service, 7001 29th, N.E.
SPOKANE	Spokane Cycle & Toy Company, 217-219 No. Post Street
YAKIMA	Staves & Son, 802 S. Naches Avenue—Phone: 29027

WEST VIRGINIA

CHARLESTON	Model Railroad Service Shop, 603 Main Street—Phone: 2-3381
CLARKSBURG	Snyder's, 324 Traders Avenue
ELKINS	Mack Nestor & Company, 203 Davis Avenue
HUNTINGTON	Phillip's Model Railroads, 1317 Charleston Avenue
WHEELING	Dunn's, 1329 Market Street

WISCONSIN

APPLETON	Schiedermayer's, 623-625 W. College Avenue
GREEN BAY	South Side Radio Service, 702 West Mason Street
MADISON	Kees Appliance Company, 124 W. Mifflin
MILWAUKEE	"Brownie, The Train Man", Brown Electric Supply Co., 3889 North Port Washington Ave.
	Garfield Cycle & Sport Shop, 2971 N. 3rd Street
	Milwaukee Model Shop, 3308 W. Lisbon Avenue
	Northern Supply Company, 2144 W. Fond du Lac Avenue
	Phone: Kilbourn 5-3388
OSHKOSH	The Hobby House, 51 Main Street
WEST ALLIS	Nelson's Sport & Golf Shop, 6320 W. Greenfield Avenue

LIONEL APPROVED SERVICE STATIONS

CANADA

ALBERTA

CALGARY
EDMONTON
Universal Hobby Supplies, 609A 8th Avenue, West
Couves Radio, 10116 103rd Street
Couves Radio, 10210 106th Street
Specialty Repairs, 106 Bradburn-Thomson Block

BRITISH COLUMBIA

VANCOUVER
VICTORIA
H. Taylor Radio & Electrical Appliance Repair Service
2450 West 36th Avenue
Vancouver Model Supply, 2193 W. Broadway
Woodward Stores Ltd.
Silsby's Electric Train Service, 1325 Balmoral Road

MANITOBA

WINNIPEG
Hamilton Laboratories, 206 Donald Block-Donald Street
Sheane & Son, 74 Chestnut Street

ONTARIO

HAMILTON
LONDON
OTTAWA
TORONTO
WEST TORONTO
WOODSTOCK
Riley Hobby Service, 755 King Street, East
Davis Radio & Electric Service, 827 Dufferin Avenue
Earl Gray, 251 Flora Street
Murphy-Gamble Ltd., 118 Sparks Street
Aikenhead Hardware, Ltd., 17-21 Temperance Street
The T. Eaton Company, Ltd.
Gore's Electric, 833 Lake Shore Road
Greenwood Hobby Shop, 222 Greenwood Avenue
Radio Maintenance & Repair, 60 36th Street, Long Branch
The Robert Simpson Company, Ltd.
Duncannon Sporting Goods, 471 Eglinton Avenue
Woodstock Electric Co., 122 Dover Street

QUEBEC

MONTREAL
QUEBEC
Electric Appliances Ltd., 622 Craig Street, West
Electrodesign, 445 St. Peter Street
Hampton Hobby Shop, 6026 Sherbrooke Avenue, West
Mitchell's Electrical Appliances, 5018 Sherbrooke, West
Arthur Richard & Son, 696 Second Avenue

FOREIGN SERVICE STATIONS

ARGENTINA

BUENOS AIRES
Ezio Guggiari Soc. de Resp. Ltd., San Martin 1145

AUSTRALIA

CAMPERDOWN,
SYDNEY
Amplion (Australasia) Pty. Ltd., 36-40 Parramatta Road

BRAZIL

SAO PAULO
Companhia Comercial Estrela, 266 Rua Joaquim Carlos
Umberto Gagliasso and Cia. Ltda., Rua Pedro Americo 52

COLOMBIA

BOGOTA
MEDELLIN
CALI
Distribuidora Philco S. A., Gerencia Carrera 9A 14-36
J. y A. Vasquez L., Carrera 49 No. 52-29
Martinez Docampo and Cia. Ltda., Carrera 8A Nos. 11-02 AL 11-14

LIONEL APPROVED SERVICE STATIONS

CUBA

HAVANA Cortina y Cia., Aguiar 609

ENGLAND

LONDON S. Guiterman and Co. Ltd., 37, Soho Square

HAWAII

HONOLULU The Hawaiian Elec. Co. Ltd., 900 Richard Street

INDIA

BOMBAY Fazalbhoj Ltd., 13, New Queen's Road
NEW DELHI Fazalbhoj Ltd., 72, Queensway
MADRAS Fazalbhoj Ltd., 1-18 Mount Road
CALCUTTA Fazalbhoj Ltd., 10, Old Court House Street

IRAN

TEHERAN Grigori Mirzaturun, 302, Tcharah Mokhber-El Dowleh

MEXICO

MEXICO CITY, D. F. H. Steele y Cia., S. A., Av. Jaurez y Balderas 27

NICARAGUA

MANAGUA J. C. Martinez and F. A. Mendieta Cia., Ltd., Apartado No. 74

NEW ZEALAND

WELLINGTON E. J. Hyams and Son, Ltd., 118-120 Wakefield Street

PAKISTAN

KARACHI Electronic & Film Equip. Ltd., Gulshan-e-Nasrat, Victoria Road, Saddar
LAHORE Electronic & Film Equip. Ltd., The Mall

PHILIPPINE ISLANDS

MANILA Philippine Education Co., 1104 Calle Castillejos

PUERTO RICO

SANTURCE Antillas Electric Corp., 118 Ponce De Leon Avenue

SOUTHERN RHODESIA

BULAWAYO Harrison and Hughson Ltd., P. O. Box 854

SWITZERLAND

ZURICH André Dewald and Fils S. A., Seestrasse 561

UNION OF SOUTH AFRICA

JOHANNESBURG Modern Appliances, Ltd., 14 New Street South
CAPE TOWN Modern Appliances, Ltd., 117-119 Bree Street
DURBAN Motor and General Sup., Ltd., 138-142 West Street
PORT ELIZABETH Modern Appliances, Ltd., 80 Main Street

LAMP REPLACEMENT CHART

Cat No.	Item	Voltage	Color	Lamp. No.	Price
022	Switch	18	Clear	752-9	.30
022C	Controller	18	Red	28-6	.30
022C	Controller	18	Green	408-45	.30
26	Bumper	12-14	Clear	151-51	.30
35	Lamp post	18	Clear	752-9	.30
042	Switch	18	Clear	752-9	.30
45	Gateman	12-14	Red	154-18	.30
56	Lamp post	18	Clear	28-3	.25
58	Lamp post	12-14	Frosted	39-3	.30
64	Lamp post	12-14	Opal	64-15	.50
70	Floodlight	12-14	Clear	151-51	.30
71	Lamp post	12-14	Clear	151-51	.30
115	Station	18	Frosted	40-3	.30
132	Station	12-14	Clear	315-20	.25
151	Semaphore	12-14	Clear	151-51	.30
152	Crossing gate	12-14	Red	152-33	.30
153	Block signal	6-8	Red	153-23	.30
153	Block signal	6-8	Green	153-24	.30
154	Highway signal	12-14	Red	154-18	.30
156	Station platform	6-8*	Clear	156-13	.25
164	Log loader	12-14	Clear	27-3	.25
182	Magnet crane	18	Red	165-53	.30
313	Bascule bridge	18	Clear	717-54	.25
364	Lumber loader	12-14	Clear	151-51	.30
394	Beacon	12-14	Clear spe.	394-10	.40
395	Floodlight tower	6-8*	Clear	Q-90	.25

Cat No.	Item	Voltage	Color	Lamp. No.	Price
622	Diesel switcher	12-14	Clear	151-51	.30
671	Locomotive	18	Clear	752-9	.30
671R	Locomotive	18	Clear	752-9	.30
675	Locomotive	18	Clear	752-9	.30
726	Locomotive	18	Clear	752-9	.30
1110	Scout locomotive	6-8	Clear	Q-90	.25
1121	Switch	12-14	Clear	27-3	.25
1121	Switch (1949)	12-14	Clear	315-20	.25
1121C	Controller	12-14	Clear	27-3	.25
1655	Switcher	12-14	Clear	27-3	.25
1656	Locomotive	12-14	Clear	27-3	.25
2020	Locomotive	18	Clear	752-9	.30
2025	Locomotive	18	Clear	752-9	.30
2026	Locomotive	18	Clear	2026-58	.30
2332	Electric locomotive	18	Clear	717-54	.30
2333	Diesel locomotive	18	Clear	2026-58	.30
2400-1-2	Pullmans	6-8*	Clear	Q-90	.25
2625-7-8	Pullmans	18	Clear	717-54	.30
4457	Caboose	12-14	Clear	315-20	.25
6457	Caboose	12-14	Clear	315-20	.25
6403B	Switching tender	12-14	Clear	616-13	.30
6420	Wrecker-caboose	12-14	Clear	2420-20	.50
6440-1-2-3	Pullmans	12-14	Clear	27-3	.25
6457	Caboose	12-14	Clear	315-20	.25
6520	Searchlight car	12-14	Clear	151-51	.30
	All transformers	6-8	Clear	Q-90	.25

*In these installations two lamps are placed in "series".

This chart lists all illuminated equipment produced in 1949. For replacement lamps used in earlier equipment consult your Approved Service Man or the Factory Service Department.

